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ABSTRACT

This publication is based on a symposium organized by the Environmental Conservation Education Division of the Soil Conservation Society of America. The major purpose of the symposium was to bring together practical and theoretical information that would be helpful to a local group that wants to initiate an adult environmental education course in cooperation with an established education or service institution. The symposium first gave attention to the overall needs and objectives of environmental education for adults, including assessment of educational needs and methods of planning and evaluating programs. Descriptions of 6 different adult education programs developed by 6 different institutions are described. Suggestions and guides for initiating and developing viable environmental education programs for adults complete the articles. (Author/RH)

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Planning and Organizing an Adult Environmental Education Program

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Foreword

Among the most impressive social phenomena of recent years has been the rise and rapid diffusion of concern about the environment. The opinion polls tell us--and news media headlines verify--that public interest in the proper care of natural resources as it relates to the fate of our species is both persistent and profound. This new vision is long overdue.

Schools and youth groups have done much during the past few years in the design and implementation of environmental education programs to help young people develop an understanding of the natural environment and some problems associated with use of natural resources. But apparently little effort has been devoted to planning and arranging learning opportunities in environmental education for adults.

In order to fulfill their responsibilities as citizens, lay persons want and need structured learning experiences that would help them:

1. Sort fact from fancy and the significant from the trivial in environmental matters by acquiring appropriate knowledge and developing skills of analysis and synthesis.
2. Examine their own and others value systems relating to environmental quality.
3. Develop skills necessary for evaluating facts and recognizing value judgments in alternative proposals for resolving environmental problems.
4. Identify courses of action for influencing public policy and decisions having environmental impact.
5. Recognize their individual responsibilities for maintaining and improving a healthful, productive, enjoyable environment in which all people can have satisfying places to live, work, and play.
6. Relate to their community, recognize its environmental problems, and actively participate in community improvement through creative conservation of natural resources.

In 1973, the Soil Conservation Society of America published "Environmental Quality and the Citizen: A Teaching Guide for Adult Education Courses Related to the Environment." Produced by the Society with the aid of a small grant from the U.S. Office of Education, the Guide presents content outlines and descriptions of different teaching techniques for use in 10 sessions of a general environmental education course for adults.

"Planning and Organizing an Adult Environmental Education Program" is based on a symposium organized by the Environmental Conservation Education Division of the Soil Conservation Society of America and presented during the Society's 28th annual meeting in Hot Springs, Arkansas, October 1973.

The major purpose of the symposium was to bring together practical and theoretical information that would be helpful to a local group that wants to initiate an adult environmental education course in cooperation with an established educational or service institution in the community. Most of the authors are educators. Some of the papers have been condensed for publication in this volume. The full text of all papers appears in "Plants/Animals/Man: The proceedings of the 28th Annual Meeting of the Soil Conservation Society of America."

The symposium first gave consideration to the overall needs and objectives of environmental education programs for adults, including assessment of educational needs and methods of planning and evaluating programs. Attention next turned to descriptions of six different adult environmental education programs carried out by six different institutions. Then, different authors offered suggestions and guides for initiating and developing viable environmental education programs for adults.

Walter E. Jeske
Symposium Chairman

Adult Environmental Education: Objectives, Opportunities, Alternatives

Donald E. Van Meter

Adult education is a term that has different meanings for different people. To some it indicates "taking a course" or going to school in the evening. To others it means attending Sunday school or an agricultural extension meeting. A broader view of adult education would include the everyday experiences encountered by individuals as they mature through adulthood. Most learning that alters the way adults think about something or changes the way they behave can be categorized into two types: (1) adult education that is a systematically organized program of adult learning, and (2) adult education that is a random experiential type of learning.

The systematically organized type includes such activities as evening classes, educational meetings, in-service training, independent study, etc. The random-type learning includes reading the paper and watching T.V., talking with friends about a particular subject, or listening to the radio. Adult environmental education takes place in both of these ways--that is, systematic learning and random learning. Neither of these can be neglected by the adult environmental educator if he hopes to reach a majority of the adults in a community.

One of the most immediate and important jobs to be done by adult environmental educators is to develop a philosophy for adult environmental education. This philosophy should point out the unique characteristics of adult environmental education. Some ideas to be included in a philosophy for adult environmental education are:

1. All adults are capable of some learning.
2. Adults learn best when given freedom and not placed under pressure.
3. Adults have specific educational needs and expectations when coming to a learning situation - these must be dealt with.
4. Adults have a wide range of experiences which can and should be used (when appropriate) in the learning situation.
5. Adults must be treated like adult learners and not like school children.
6. Adult environmental education is one of the most important (if not the most important) types of education needed by adults today.
7. Adult environmental education should include learning about natural resources and natural systems, and also provide motivation for changing adult behaviors to achieve a better quality environment.

No educational program can be successful without objectives and a means to attain these objectives. The objectives of adult environmental education will vary somewhat from community to community depending upon the specific needs of the adults in the community. Nevertheless, each adult environmental education program should include in its major thrust the following points:

1. The future of mankind is ultimately dependent upon the way the world's natural resources are managed.
2. In using natural resources, man must be sensitive to social, cultural, and political attitudes within the community and nation.
3. The interdependency of natural resources dictate that they be managed as an ecological unit.
4. The use and management of natural resources must be accomplished within the framework of economic reality, but not be influenced and guided totally by dollars alone.
5. The responsibility for having a quality environment must be shared by the people, state-local-federal govern-

Dr. Donald E. Van Meter, Associate Professor, Department of Natural Resources, Ball State University, Muncie, Indiana.

ment, and the professional resource managers.

Even when adult environmental education programs are established to solve specific local problems, the above objectives should still be considered. The solution of small local problems will not necessarily solve the environmental ills of a state or the nation. It is imperative that adults be able to see the "big picture" with regards to environmental quality in the U.S. and the world. Adults need to realize that without foresight and without the understanding of environmental systems, attempts to solve one environmental problem may result in two or three more serious environmental problems.

There is no single best place where adult environmental education can or should take place. Adult environmental education can be effective when structured through existing institutions such as labor unions, service clubs, industry, soil and water conservation organizations. Almost everyone belongs to some organization or institution. These organizations can be very effective channels for exposing adults to environmental education; in many cases this is probably more effective than setting up a new organization solely for the purpose of environmental education.

In some situations a special meeting must be called or a new group must be formed in order for adult environmental education to occur. This is often a slower way to educate adults because they must make time available for this activity and perhaps give up a former activity or organization. Unless the new group is extremely exciting and promptly fulfills a need, adults are reluctant to abandon old ways for the new environmental education opportunities.

Adult evening classes sponsored by local school systems and community colleges also provide an opportunity for adult environmental education. These courses are coming into existence, but enrollment cannot hope to be increased unless each course is developed with the specific needs and interests of the adult clientele considered. Too often these courses stress the theory of environmental quality with little concern as to how this information is directly helpful and beneficial to the adult. Environmental education materials should be taught in most classes taken by adults regardless of the subject matter. No subject, as a subject, is more environmental than any other subject.

The mass media is one of the most effective ways to reach large numbers of adults. Although the mass media has long been used to educate and inform adults about the environment, there is much that can still be done. Television probably has the biggest potential for adult environmental education on a large scale. Skillfully prepared entertaining programs could and should be produced that would show adults how they could contribute to a quality environment. There is a great opportunity for state departments of natural resources, Soil Conservation Service, Extension Service, and universities to work with TV stations in presenting monthly or even weekly one-half hour programs informing the public on such matters as outdoor recreation opportunities in the state, resources development programs that need public support, air and water quality problems and solutions, and many other concerns.

Proper planning of adult education programs is the key to successful adult environmental education. In the brief appendix to this paper, I discuss the essential elements of adult environmental education program planning. Planning educational programs for adults is quite different than planning for children. Usually it is wise to include the adults participating in the program in the planning process. This enables the program to be more indigenous and meaningful to those participating. The expectations of adults in an environmental education program must be reconciled early in the program. This information can be used as input into the program planning procedure. Prepackaged adult environmental education programs are usually not too successful because the participants don't obtain from the program what they want -- they get only what someone else thinks they want or need. College and university prepackaged adult courses have had adequate enrollments mainly because the participants wanted (or needed) academic credits -- not because the material presented was ideal for them. Exhaustive diagnostic work should be completed to determine adult interests and needs before initiating adult environmental education programs in a community.

The need for adult environmental education is great. The problems of managing deer in Michigan, preventing soil erosion in Iowa, or managing timber in Georgia are not primarily biological problems. They are people problems that occur because of a lack of understanding and support from the public - not from the absence of scientific facts or research. In a democracy it is the people who ultimately have the responsibility for making decisions that determine the quality of the environment. Every day in communities throughout the U.S. there are environmental problems emerging that need immediate attention. Fuel shortages, solid waste disposal problems, overcrowding, air and water pollution, and a host of other issues confront the voter day after day. How can the average adult make intelligent decisions about these problems if he knows nothing about natural resources and natural systems? He can't!

And if a concentrated attempt is not made now to educate this generation of adults who make these decisions, the quality of our environment will surely be diminished. To paraphrase Gifford Pinchot: "A nation deprived of liberty may win it, a nation divided may reunite, but a nation whose natural resources are destroyed must inevitably pay the penalty of poverty, degradation, and decay."

APPENDIX

Elements of Program Planning

Program planning is essential to all educational programs. For adult environmental education,program planning takes on an even greater importance. Adults are busy people and want every minute they spend in an educational program to be focused toward meeting their goals. This means that only the well planned and well executed programs will reach adults and bring them back for additional educational experiences.

Adult Environmental Education program planning can be viewed as having three broad phases: (1) diagnosing or assessing educational interests and needs, (2) developing the actual program, and (3) evaluating the program. Each of these phases is equally important and necessary in successful educational programs. Ignoring one of the phases will substantially weaken the entire program.

Assessing Educational Interests and Needs of Adults

Adults seldom voluntarily attend educational programs unless they are particularly interested in the subject matter or the subject matter is needed to enable them to do something they really want to do. Thus it becomes extremely important to determine accurately what adults are interested in learning about. Often it is even necessary to establish the specific aspect of a general topic they wish to explore.

In order to determine these interests and needs the adult environmental educator must systematically examine the wants and desires of his adult clientele. One such procedure is described below.

The first step is to determine specifically what kinds of information one wants to obtain from the adult group (the group may be a whole community, a service club, or any other group of adults). That is, what kinds of interests are being considered. For example: interests in air pollution, soil conservation, conservation education, pollution control, etc. Unless the scope of interests is narrowed, very little useful data will be obtained to help develop an educational program.

The second step is to contact individual members of the adult group and find out what they, and what they think others in the group, are interested in learning, within the general topic the adult environmental educator has selected. If there are no definite aspects of the general topic that these individuals are interested in, it is quite likely that the broad topic is not appropriate and a new one must be found.

During the third step a list is made of all the interests of the individuals contacted. It should be kept in mind that the more closely the individuals represent the group, the more accurate this list of interests will be. It is possible that the interests and needs on the list will indicate only the direction the adult educational program should take and not express the real needs and desires of the group. This list may only provide symptoms or indications of what real interests and needs exist. For example, a group of adults may indicate that they need and are interested in crop fertilization for obtaining higher yields, while in reality what they really need is information on how to apply soil and water conservation practices that will improve crop yields. The adult environmental educator must often look deeper than just what adults think they need.

The fourth and final step, then, is to deduce the real needs and interests from the comments of the adults, and to use these as the specific topics for the adult education programs. The educator will often have to supplement the program with material he knows to be important, but he should use the deduced interests and needs as the basis to develop an educational program.

Developing the Educational Program

From the topics developed during the first phase of program planning, the objectives or purposes of the educational program are established. These objectives must be concise and relatively easy for adults to achieve. When the objectives are determined, the adults should feel satisfied and happy that they participated in the program. It is especially important in adult education to have clearly worded and simply stated objectives. The adult participants should be aware of the program's objectives at all times and able to refer to the objectives from time to time during the program.

After the objectives are established, the adult environmental educator determines the educational resources he has at his disposal to help achieve the objectives. Educational

resources include such items as films, instructors, slide pictures, books, resource people, natural features on the land, the adult students themselves, and many more.

The next activity is to select a method or technique to use in bringing the educational resources to the adult student. For example, if the educational resource was a natural feature on the land, a field trip might be the best technique to use in bringing resource and student together. If an authority on the subject under discussion is available, a lecture may be most appropriate to get the information across. Other techniques available include panels, group discussion, demonstrations, symposium, and the forum. More than one technique is often used in the same program and subtechniques such as question and answer sessions and buzz groups are used to supplement these techniques.

Finally, the details or mechanics of the program must be worked out. Such details as meeting time and location, number and length of sessions, physical facilities in the room, available equipment, and the lighting and temperature of the room must be considered. It would be unwise to hold a meeting which was to be attended by older adults on the 6th floor of a building without elevators, with dim lights, first grader's desks, and 40 degree temperatures. Publicity about the educational program is also an important detail that often makes for the success or failure of the event.

Evaluating the Program

The third and final phase of program planning is to develop a means for evaluating the success of the educational program. This information can be used to improve future programs, and in some cases if started soon enough, can help improve the on-going program.

The evaluation procedure is dependent to a large extent on clearly stated objectives. The educator must determine before hand what adult behaviors or actions he will accept as evidence that objectives are being reached. He then must devise a method (observations, written test, etc.) of recording this evidence so he can compare what he previously determined as acceptable behavior with what the adults really did achieve in the educational program. From this comparison an intelligent estimate can be made relative to the success or failure of the program.

Usually self-appraisal is the best method of evaluation in adult education programs. If adults are kept informed of objectives, they usually can see how they are progressing toward goals; it also should help improve the program by pointing out weaknesses in instructional procedures and techniques. Evaluation can also be used to justify or eliminate continued support for educational programs.

A Program for Community Leaders and Decision-Makers

Ralph J. Kotich

In order for any program in environmental education to be effective, it must consider all facets of the community. If community leaders and decision makers are to be effective, they need a well informed public to deal with. In analyzing an environmental educational program, knowledge, attitude, and skills need to be developed for the professional, the community leader, the political leader, and the general public. This process is dynamic and never twice the same in any one community or issue. All facets need to be considered at all times. Any time one facet is left out, serious problems may arise resulting in confrontation, indecision, and stalemates. Once this happens, progress may still come about but many times only after a long delay, depending upon how serious the issue becomes.

The Colorado State University Extension Service, during the past few years, has operated on a task force committee approach. We have had some success in bringing together expertise in social, economic, political, and natural resource disciplines in aiding the community in solving local community problems in the environmental arena. Land use concerns have brought together many disciplines in working with community leaders and the general public to combine their efforts in dealing with local situations.

I would now like to review the kinds of program efforts that we have experienced that may be helpful to you in working in your local situation.

GENERAL PUBLIC PROGRAMS

Environmental Program Packet

An environmental packet was developed for women's programs that allowed a local club president to present an entire program on environment. It included a meeting outline, environmental facts and figures, action program suggestions, how to initiate a program, a slide set with script, and hand-out material for members at the meeting. The program series is listed in our program packet catalog and mailed from a central office on our campus. The slides are on a program loan basis. The first year, this program reached some 2,500 people in Colorado.

Plant A Tree Program

As a result of the task force coordination a "Plant A Tree" program was developed which received widespread use throughout Colorado. Many different approaches are being used and thousands of trees are being planted. Soil Conservation districts, garden clubs, Arbor Day

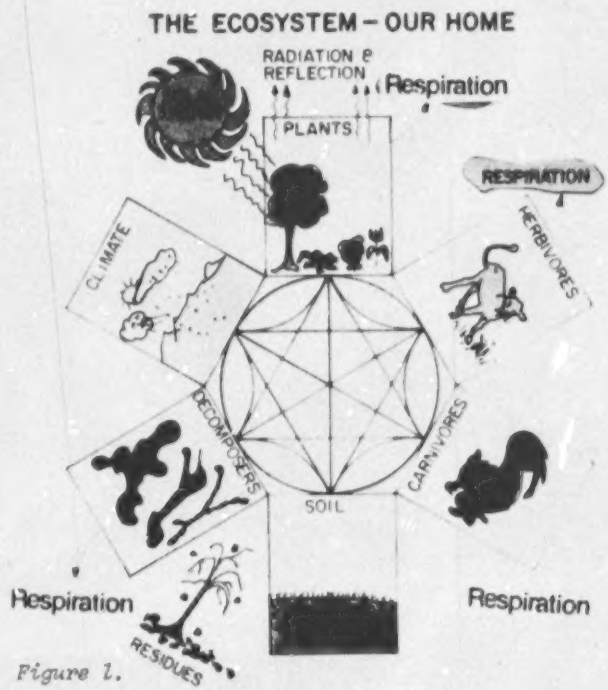

Figure 1.

Ralph J. Kotich, District Extension Director, Cooperative Extension Service, Colorado State University, Fort Collins, Colorado.

committees, and many organizations have become involved. Seedling trees as well as specimen trees are being planted.

Environmental Newsletter

As a result of the deluge of material on the environmental crisis, a screening process to supply relevant information was organized. An "Environmental Views" newsletter was developed for this purpose.

A Primer on the Ecosystem

Since everyone was becoming an "ecologist", some of whom we are not sure even knew how to spell the word, we felt it was an absolute must that a simple basic primer on the ecosystem be developed. This primer uses a basic approach in explaining how the ecosystem functions and how man's decision-making role and manipulation can compliment the system and improve the environment. (See Figure 1)

Keep Colorado Colorful

For organized groups, a publication entitled "Keep Colorado Colorful" was developed. This brochure has a simple outline showing what is involved in community action programs and what needs to be done for them to be successful.

Outdoor Education Laboratories

It was also apparent that outdoor education laboratories were needed throughout Colorado. The Plains Conservation Center, for example, was one of our most successfully coordinated efforts. This center is operated by the West Arapahoe Soil Conservation District through a Board of Trustees appointed by the district.

Subject Matter Short Courses

Subject matter short courses were developed for the general public dealing with range ecology, land use and development, and one called "Microville." Microville is a sign-up program designed for community leaders. The group goes through a simulated exercise of community decision-making by role playing. (See Figure 2)

PROFESSIONAL, POLITICAL, AND COMMUNITY LEADERS

Professional Seminars for Select Audiences

It was apparent to us that the professional, be he a government employee or a politically elected official such as a commissioner or assessor, was often frustrated by the new environmental pressures. As a result, seminars were established on ecosystems management with varying degrees of emphasis on technology.

Subject Matter Audio Tapes

A thirty-minute monthly audio tape program was developed dealing with all aspects of ecology but using range lands as a base point. For the last three years, an average of one hundred tapes go out each month with an average listening audience of seven per tape.

Video Tapes

We are now in the process of preparing video tapes on ecology as a new educational technique geared to the professional.

Land Use Package

The task force has developed a land use handbook for professionals. It includes

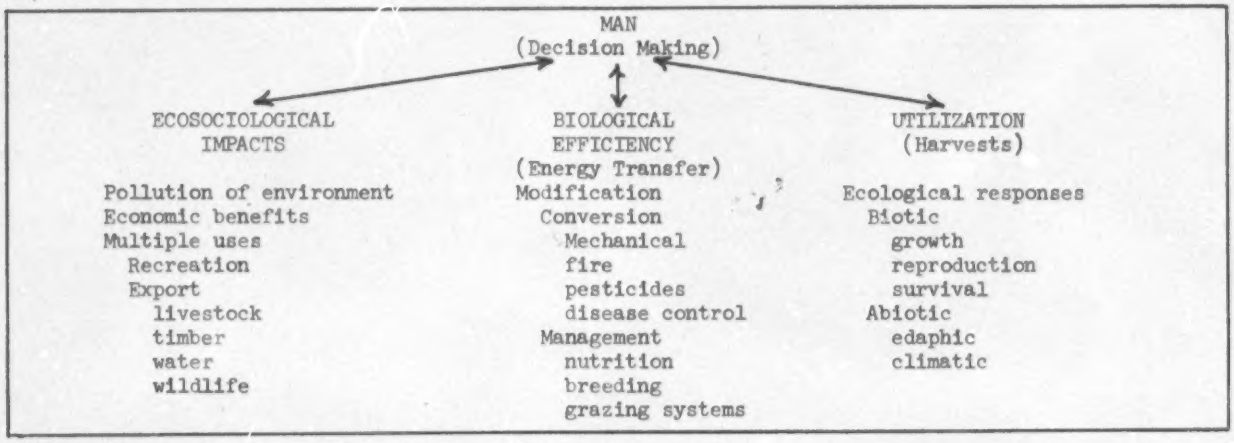

Figure 2.

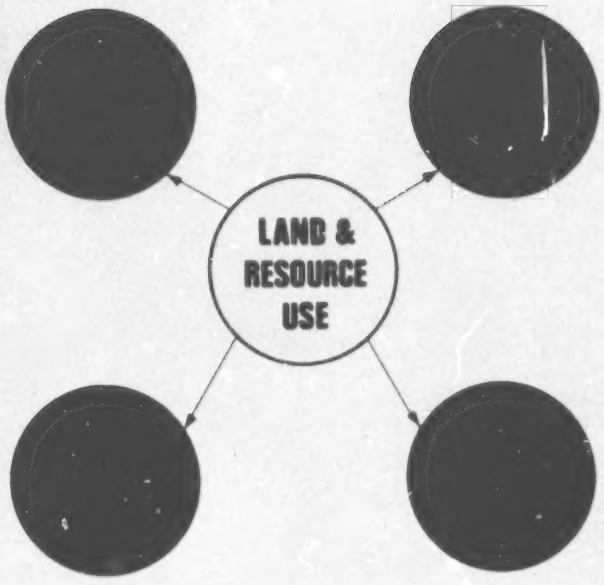

Figure 3.

agencies and organizations that are involved in land use planning, defines the aspects of land use planning they are involved in and where they can be located. It also includes a land use planning process model which outlines the political, technical, social, and educational roles necessary in bringing about sound land use. Publications on soils interpretation, with accompanying slides and relevant fact sheets on land use planning, are included. The task force has also developed a guide for use in county land use planning. (See Figure 3)

Multi-Disciplinary Teams

We are now in the process of developing financial support for multi-disciplinary teams to be sent to the field to aid local community leaders and decision makers in solving local problems.

SUMMARY

Colorado is faced with the fastest growing land development problems of any state in the Union today. It is our hope that the broad-based educational program which we are developing will, in part, aid the state in allowing for orderly growth with the least damaging effects. It is quite obvious to us that the job to be done is much greater than any one individual, agency, or organization can handle and that a team effort is imperative.

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Training Citizen Advisers to Local Government in Natural Resources Inventory & Analysis

James E. Ashton, Harlan B. Brumsted, Ernest E. Hardy

Pressures on the natural resources of the Nation presently are great and promise to intensify as population, expectations of individuals, and our ability to consume interact upon a finite resource base.

Today, land is coming into focus as a major resource requiring greater care and deliberation in determining its proper use. Town and village governments act daily upon land use proposals involving thousands of acres and millions of dollars. In the traditional pattern, economic and political criteria usually are the only yardsticks for decisions. We all sense that change is near, however, as we note the concerted study of federal land use legislation and the priority that states such as New York are according land use issues.

Recent years have seen the rise of citizens, banding together and voicing great concern -- often with considerable emotion -- over land use decisions within a local community. Orderly citizen participation in decisions affecting local resources, on the other hand, has become a part of some local governmental procedures in the Northeastern States through the Conservation Commission movement. Conservation or environmental commissions are small, locally appointed bodies of citizens with responsibility to advise local governments on matters of environmental quality. They may also have review powers similar to those of planning and zoning boards. From a beginning in Massachusetts about 15 years ago, there are, today, nearly 1,500 commissions in the states of New York, Connecticut, New Hampshire, New Jersey, Maine, Massachusetts and Rhode Island.[1]

New York's most recent legislation providing for formation of conservation commissions, passed in 1970, enables creation of "conservation advisory commissions" at town, village, and city levels, and of "environmental management councils" to serve counties and regions. These bodies are charged to advise their respective levels of government in all matters affecting the preservation, development, and use of natural resources, with special concern for maintaining ecological suitability of use. Of particular pertinence to our subject is the fact that prescribed duties of both bodies include "conducting researches" into land areas they encompass; specifically, to inventory, index, and map open areas and all wetlands present. County councils, in addition, are required to prepare a plan for environmental protection and to report annually on the state of the county environment. To date, 25 of New York's 62 counties have established Environmental Management Councils and 5 additional counties are joined in a regional Council. Two hundred twenty-two conservation advisory commissions have been formed, most at town and

James E. Ashton, Cooperative Extension Agent, Dutchess County, Millbrook, N.Y. Dr. Harlan Brumsted, Associate Professor, Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University, Ithaca, N.Y. Dr. Ernest E. Hardy, Senior Research Associate, Department of Natural Resources, New York State College of Agriculture and Life Sciences, Cornell University, Ithaca, N.Y.

[1] For background on commission experience see: Scheffey, Andrew J. W. 1969. Conservation Commissions in Massachusetts. The Conservation Foundation, Washington, D. C. 216 p. Available from: New England Conservation Services Center, South Great Rd., Lincoln, Ma. 01773 $3.00

village levels. This initial organizational activity tends to be associated with areas of high population density, notably Long Island and suburban towns or upstate cities.

Cooperative Extension in Dutchess County was contacted by the newly formed commissions for assistance in identifying and dealing with local conservation problems. Extension's early efforts with these bodies were mostly organizational, but the potential for training these citizen advisers to discharge their specific duties in inventory and analysis with competence was recognized early. In 1971-72, a sabbatic leave afforded Mr. Ashton opportunity to develop a plan for the training program he envisaged, as partial fulfillment of the Master of Professional Studies (Agriculture) Degree requirements at Cornell University.

Natural resource inventory training is designed to enable citizens themselves to determine the potential uses and protection needs of a community's resources, based upon resource availability and physical-ecological characteristics. The inventory procedure begins with determination of items to be inventoried from among the many possibilities such as: soil type, slope, bedrock, flood plain, drainage, vegetation, general land use, zoning patterns, wildlife habitat, wetlands, vistas, land ownership pattern, open space, types of agriculture, etc. We have worked with centers in developing a basic understanding of and skill in applying four fundamental tools that are readily available in most communities:

1. U. S. G. S., topographic maps, 1:24,000 scale, as the base map: an aid of primary value which alone supplies 104 items of natural and cultural data.

2. The soil survey and soil map for the community. Soil maps on acetate and to 1:24,000 scale usually are available from county planning offices in our state. In addition, the Soil Conservation Service and N. Y. S. College of Agriculture and Life Sciences, recently completed the publication "Soil Survey Interpretations of Soils in New York State," a manual of special value in making interpretations for community development purposes.

3. New York State's Land Use and Natural Resources Inventory (LUNR). LUNR material was developed by transcribing information interpreted from aerial photographs onto U. S. G. S. maps. Transparent overlays are made showing types of land use as well as point data (roads, houses, cemeteries, factories, etc.) for each U. S. G. S. quadrangle within the State.

4. Citizen conservationists are taught the fundamentals of interpreting aerial photographs, particularly their use in up-dating older maps and making preliminary surveys for impact statements. Only basics are included with no attempt to work with stero-pairs.

On completion of training in applying these basic tools, commissions choose items for their initial inventory. These items should be the primary natural characteristics such as soils, water, vegetation, present land use; elements that reflect the physiography and ecology of the community and represent basic determinants for future land use.

Information collected in the inventory process is placed on overlays, then rated or evaluated for suitability for a given use; i.e., severely limiting, moderately limiting, slightly limiting, and color coded on the overlay in red, yellow, and green, respectively. When two or more overlays are stacked, areas emerge which appear safe or hazardous for a given type of land use. Essentially, this is the method of Professor Philip Lewis, University of Wisconsin, whereby "environmental corridors" become apparent when overlays showing various resources and land uses are combined.

In his applications, the "corridors" define needs for open space preservation and suggest sites for recreation area development.[1]

Each overlay becomes a data cell and additional overlays can be developed to portray any natural or cultural resource.

TESTING AND TEACHING THE INVENTORY PROCESS

The Town of Clinton, Dutchess County, was selected as a pilot town for teaching the Natural Resource Inventory method. Training took place in October, 1972. Twelve members of the town's Conservation Advisory Commission participated in the five-week program. Commission members readily entered into an agreement to test the program, but some expressed personal reservations about their ability to deal with techniques associated with soil surveys and aerial photographs. Assistance in planning the training and teaching of the series was obtained from the soil scientist with the Dutchess County Soil and Water Conservation District, a professional planner, and a professor of natural resources from Dutchess County Community College. McHarg's film, "Multiply and

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[1] For discussion of concept see: Lewis, Philip, Jr. 1964. Quality Corridors for Wisconsin. Landscape Arch. Quarterly. January. p. 100-107.

Subdue the Earth," was used as orientation and background in the first session.

Training was held at the Farm and Home Center for three hours, one night each week, for five weeks. One session was devoted to each subject: Soil Surveys, Air Photos, LUNR, and mapping. Between sessions, work was assigned requiring application of information covered the preceding week. Discussion of assignments was held weekly. Sessions were informal, a condition which encouraged questions and discussion of practical applications based on observations of participants.

The enthusiasm of participants was evidenced by the start of a town resource inventory immediately upon the completion of this training. Clinton's Commission divided into three study groups to inventory land use, soils, (slope, drainage, flood plain, bedrock, and erodibility) and water resources (surface water and aquifers). Experience with the pilot town project revealed problems with the transparency of various grades of acetate, also with applying colors to acetate. Magic markers were finally chosen and, when finished, each sheet was sprayed with a clear paint fixative.

The pilot town project also led to a program for all commissions in the county. Twelve commissions (sixty-five members in all) took part in the second series of five training sessions, held January-February, 1973. Each town commission was provided a list of material needed for the training, together with a suggested budget. Materials included: base maps, LUNR overlays, acetate, markers, rulers, etc. Budgets were about $50 per town, excluding air photos. The later programs followed the pattern of the pilot series. Homework exercises required participants to define open space for their towns; react to a proposed new road which intersected sensitive geological, cultural, and physiographic areas; locate sanitary landfills; and produce an impact statement for a proposed housing development.

On completion of training, commissions were encouraged to begin their inventory immediately. Local resource people, including Cooperative Extension agents, Soil Conservation Service personnel, Department of Environmental Conservation foresters and wildlife biologists, professionals in the County Planning Department, made themselves available for questions from any commission. Two months after training, a county-wide session was held to review the commissions' progress and determine future training needs. As a result of this review, additional training was scheduled in areas of soils - public health relationships (conducted by County Health Department), and ground water resources (to be conducted with help of U. S. Geological Survey).

IMMEDIATE RESULTS

Resource Inventory Training has acted as a stimulus for concerted action by town commissions. To a significant extent, the training has transformed interested citizens into knowledgeable citizens, capable of participating in decision making. As well, it has provided a uniform, basic level of knowledge for future resource inventory and analysis in these towns.

Ten towns have now begun inventories, nine of them aided by Ford Foundation grants to cover costs and publish results.

The Town Commission of Pleasant Valley was asked by their Town Board to assist in locating a new sanitary landfill. Using the inventory method, thirty-three potential sites were located. Consideration of political, economic, and social factors narrowed the list to six possible sites. The Town Board currently is making the final selection from among the six alternatives identified by the Commission.

The Dutchess County Planning Board has used soils inventory information in the impact statement for a 1,000-unit Planned Unit Development in the Town of Rhinebeck.

A citizens group from the Town of Beekman has proposed a moratorium on all development there until completion of the resource inventory.

Dutchess County Community College has developed a course on resource inventory and analysis based on this training program. Two towns have hired students who took the course to assist in their inventory process. This fall, the evening division of the Community College will teach the same course for members of several commissions who missed the initial training program.

FUTURE APPLICATIONS

From our pilot experiences, it is apparent that this training program has the following potential applications in Dutchess County, New York State, and elsewhere:

- --Furnishing a basic understanding of tools and techniques commonly employed by natural resource managers and planners that will help achieve effective communication between these professionals and the citizen leaders with whom they work.
- --Developing citizen ability to participate effectively in both the inventory process and the subsequent steps in decision making.
- --For those who have received this basic training, offering instruction in more

specialized subjects such as the relationships between sanitary codes and soil and water characteristics, also, preparing these citizens to relate their town-level activities to development of county and regional inventories.

Additional training programs with appropriate materials are under development. Several of the two year colleges within the State University of New York are now offering, or are preparing to offer, courses in resource inventory techniques. The benefits of the development of effective technical skills among local citizens is already evident in many areas of the state. We look to continued beneficial influences on land use and natural resource management in the future.

LIST OF SELECTED REFERENCES, Partially Annotated

These are among the materials used in the course which have proved especially useful.

Forester's Guide to Aerial Photo Interpretation, Agricultural Handbook 308, USDA, Forest Service, Supt. of Documents, U.S. Government Printing Office, Washington, D. C. 20402. A brief reference on advantages and disadvantages of applying aerial photo interpretation, including: methods of identifying classes of vegetation; measuring areas; sampling methods for forest inventory.

Greenhood, D. Mapping. Phoenix Science #521. Univ. of Chicago Press, Chicago. Provides beginner an appreciation of map interpretation and construction. Part one tells what information can be extracted from maps and various modes of presentation. Part two covers procedures in map making and equipment required. Contains selected bibliography and detailed index.

Guide to Making Appraisals of Potential for Outdoor Recreation. 1966. Soil Conservation Service, U.S.D.A. Washington, D. C. 20250.

Hamilton, L.S. Ecological Relationships and the Land Use Planning Process in a Watershed. 1971. Cornell University, Fernow Hall, Ithaca, N.Y. 14850. Concern is expressed over lack of consideration for the role of natural resources in land use planning; emphasizes the importance of ecologically-based land use planning and offers a land use matrix which, to an extent, quantifies the effect of a change in one section of the ecosystem upon the remainder. While the matrix has limitations, the need for this type of approach to assessing environmental impacts is stressed.

Hardy, E.E. and R.L. Shelton. Inventorying New York's Land Use and Natural Resources. New York's Food and Life Sciences Quarterly. Reprint available from author; Fernow Hall, Cornell University, Ithaca, N.Y. 14850. Describes and outlines steps in developing a statewide land use and natural resource inventory necessary for effective planning. The underlying purpose is described, land use categories listed, and means of retrieving stored information explained. Authors conclude that techniques for maintaining a flexible, comprehensive and detailed inventory of land use and natural resources have been established.

Hills, Angus G. The Ecological Basis for Land Use Planning. 1961. Research Report No. 46. Ontario Dept. of Lands and Forests, Toronto, Canada. Author noted for an analytic method to evaluate potential biological productivity of an area. Approach illustrates principles and practices of good farming, forest, and wildlife management in an attempt to formulate a basis for land use policies. Hills' method starts at general level, then disaggregates until a site type is defined. Units are combined to form landscape components which define biological productivity. Once productivity is known, areas are reaggregated into various stages until a multi-use plan with major and co-major recommendations is delineated.

Index of Topographic Maps. Map Information Office, U.S. Geological Survey, Washington, D.C. 20242.

LUNR Inventory: What it Does and How to Use It. Office of Planning Services, 488 Broadway, Albany, N.Y.

Soil Survey Interpretations of Soils in New York State. Dept. of Agronomy, Cornell University. Mimeo 72-4 and U.S. Dept. of Agriculture, S.C.S., Syracuse, N.Y. A guide for selected uses of soils for resource material, engineering, community development, cropland, recreation, woodland and wildlife.

Use of Air Photos for Rural and Urban Planning, Agricultural Handbook No. 315. E.R.S., U.S.D.A., U.S. Govt. Printing Office, Washington, D. C. 20402. Many uses of air photos for planning are described. The book also describes how air photos are made and how photogrammetry and photo interpretation assist in preparing plans for rural and urban development.

A Program Instituted by a Citizens' Organization

Katharine N. Mergen

In this country, citizen influence has long been significant in conservation through action programs, philosophical attitudes, and political pressures. Moreover, under our form of government, each and every citizen, in the final analysis, does have an effect on local, state, and national conservation issues. This effect may be positive, through support or opposition, or negative through apathy and indifference that leaves decisions to activists who may or may not have special axes to grind.

Schools throughout the country are increasingly working to incorporate environmental studies into the curriculum, but there are many conservation decisions that cannot wait for today's sixth graders to grow up.

Adult education is one of the obvious ways to a quicker environmental return from citizens. The influence of lively and stimulating adult education programs would likely be reflected almost immediately in citizen participation in local environmental decisions and in citizen action at the ballot box. But up to now few concentrated efforts have been made to reach the adult audience through an organized education program.

One adult conservation education program instituted by a citizen organization began about 75 years ago in Washington, D. C., when the Audubon Naturalist Society of the Central Atlantic States undertook a volunteer effort to interest people of the community in the study of natural history.

Today the program is known as the USDA Graduate School Program of Natural History Field Studies, and each year enrolls about 400 adult students in 24 established and continuing courses.

The Field School is a direct descendant of a 19th century citizen action group that set out to influence public thinking in relation to natural resources.

Early reports from the Audubon Naturalist Society describe a lecture, complete with "lantern slides," that was presented to an audience of 400 people in Washington. Before the turn of the century, classes were arranged by Audubon members for teachers in training at the Washington Normal School. Volunteers worked then with classroom teachers in elementary schools -- as they still do today.

These efforts continued without much attempt to give the studies continuity or structure until 1955 when Dr. Irston Barnes, an economist by profession and a dedicated member of the Naturalist Society, organized a series of field study classes as a continuing program of ecological studies.

These classes proved to be so popular that the work of recruiting and training volunteers to lead them turned out to be a monumental effort for Society members. Dr. Barnes did the obvious thing -- he enlisted the help of government agencies, conservation organizations, and local colleges to supplement Audubon Society members as instructors.

Ben Osborn, editor of the SCS Soil Conservation Magazine for many years before his retirement, was one of those recruited by Dr. Barnes. His first seminar and field trip study course in 1958 was on "Principles and Practices of Land Use," which is still today one of the core courses in the Field Studies program.

It was mainly through Ben Osborn's influence that the Audubon Naturalist Society's Field School became a part of the USDA Graduate School in 1961. Beginning with a core curriculum of 12 courses, the program has now expanded to 24 courses offered each year. But to earn the Graduate School Certificate of Accomplishment, students must finish each of the 12 core courses.

The present arrangement provides that the

Katharine N. Mergen, Head, Educational Relations, Soil Conservation Service, Washington, D.C.

Graduate School handle the administrative details: registering students, collecting fees, paying instructors, keeping records, arranging for classroom space, and issuing Certificates.

The Field School director, with the help and concurrence of the Audubon Naturalist Society board of directors, recruits instructors, adds new courses as the need arises, or changes and updates the content of established courses. The Society does some promotional work to attract students, and some of the members serve as instructors.

Much of the strength of the Field School program lies in its emphasis on understanding the interdependence of living and non-living components of the total ecosystem rather than focusing on fragmented problems or issues.

Field trips are an integral and important part of the course work. Students are expected to participate in each of these just as they are expected to attend all class meetings. It is part of the instructor's job to make all arrangements for field trips, first by selecting the appropriate site for a particular study, and then by writing to agencies or owners to ask permission for the visit and to explain the purpose of the field trip. Maintaining good relations with those who cooperate in the field studies is essential to the success of the program.

Detailed time schedules are prepared, and routes and rendezvous points established. In a smaller community, preparations might not be so elaborate, but in the crowded Washington, D. C., area, it is necessary that details be spelled out carefully. Car pools are encouraged to minimize the number of vehicles on the road.

Part of the class meeting is spent in preparation for field trips, to outline study projects, discuss conservation practices to be observed, and relate the outdoor experience to course objectives. Field trips are made rain or shine, so students learn to come prepared.

There is no substitute for outdoor experiences in conservation studies; no other way to gain the sensory perceptions that engender sensitivity to the environment. Field trips are the one way of bringing into focus for a group an understanding of management practices and recognition of environmental problems.

Classes are limited to not more than 20 students if possible, to encourage individual participation and to make field trips something other than a mob scene.

Today's students often bring with them a curious mixture of fact and myth gleaned from TV or casual reading. But they are usually quick to identify and resent special interest propaganda. Many are college graduates, but few have much scientific background.

For most of them, the technical jargon that becomes a habit with some professional resources managers means nothing. Technical terms must be clarified by the instructor and explained in layman's language. By the end of the course, however, they have learned to understand the connotations of jargon as verbal shorthand, and they will recognize and know how to apply it to future situations.

The complexity of subject matter that must be covered in the limited time, and questions of value judgments and management alternatives that inevitably arise in class, demand instructors with a broad background who are up-to-date on issues, widely read in the general literature of conservation, and very much aware of political action.

Let's take some examples of actual course outlines and examine them in detail.

Because of the emphasis on field trips, the first course in the core series, titled "Introduction to the Outdoors" is just that. Students are introduced to map reading, using a compass, keying out plants, and how to make themselves comfortable in the outdoors. It doesn't do much good to take a city-oriented person on a field trip if the feet hurt and the student hasn't had enough preparation on the study area to ask intelligent questions.

For this first course, field trips include nature studies in wild areas, a visit to a public recreation area in a National Park (usually an overnight camping experience), and trips to wildlife management areas, farms, and outdoor areas for special uses.

The course on "Land Use Principles," mentioned earlier, is based on stated objectives prepared for the students and which read in part, "...a search for principles of land use to guide our decisions, and our attitudes toward the decisions of others, regarding the use of land resources. This search is essentially an exercise in synthesis of information from the natural and social sciences as applied to practical matters of land use."

Students are asked early in the course to consider ecological, esthetic, ethical, and economic principles in relation to land use. They investigate resource supply and demand, trends in land and water uses, physical characteristics of soils in relation to various uses, soil and water relationships, and land classification. They learn what a conservation plan for a farm includes and how it influences the application of conservation practices.

Urban and suburban land uses are considered

first in light of change from rural to urban uses and how this affects the resources. The student then begins to consider urban and suburban land uses in relation to human spatial and social needs.

Field trips are made to both rural and urbanized areas, including the Rock Creek watershed immediately north of Washington, D. C. Here the students learn what urbanization does to a watershed and how hard-surfaced streets and roofs change the water runoff patterns that affect down-stream communities.

At the end of the course, students hand in a land-use plan for a selected area, complete with specific objectives and justifications for reasons behind the plan.

In studying "Conservation in Action" the course objective is to give students an understanding of how resource management practices are applied and how citizens can have a role in developing, changing, or implementing such programs.

The first class meeting deals with management of public lands---federal, state, and local. The first field trip is to a National Forest. The local ranger meets the group at a designated location and leads the class through various stops where he explains management practices, goals, and problems. Everything from vandalism to controversial issues such as clear-cutting may become topics for discussion with the class members.

In the same pattern, the second class meeting is devoted to conservation in action on private lands, and the second field trip includes a working farm and a PL 566 watershed project. District leaders and SCS district conservationists serve as guides and answer questions.

The final study deals with a planned community -- in this instance a visit to Columbia, Maryland -- where a private developer is attempting to put conservation into action and at the same time provide homes, shopping centers, schools, recreation areas, and industrial sites to attract buyers and renters to his property. The SCS district conservationist, who has worked with the developer in applying some of the conservation practices, explains the details of each project, often accompanied by a District leader.

This brief summary of three of the 24 courses offered by the Field School will give some idea of the amount of detailed work that goes into the organization of such a program and probably suggest some of the reasons for enlisting the services of local organizations and educational institutions.

In developing an adult environmental education program, almost any citizen organization might serve as a nucleus. Groups already oriented toward conservation and environmental issues might seem more likely to undertake such a project, but no organization should be written off without investigation.

There are many advantages in affiliation with an established educational institution, such as the USDA Graduate School. Almost every community has one or more such educational institutions -- high schools, a community college, a university or state college.

Being a part of an ongoing institution helps give stability and continuity to the adult education program. Without this support there is always the danger of an uneven pattern of development, or of getting lost in too many administrative details. Often the loss of just one enthusiastic leader can bring about a collapse of the entire program if it is not a part of an established educational institution.

SCSA, as a national organization of professional conservationists and resource managers with a genuine concern for the art and science of good land and resource use, is uniquely qualified to take leadership in developing and implementing an adult environmental education program. The foundation has now been laid for such an endeavor.

APPENDIX

Courses, Natural History Field Studies, USDA Graduate School (Core Courses: Years 1-4).

Year	
	Basic Biology (Prerequisite Course)
1	Introduction to Outdoors
	Plant Identification I
	Plant Identification II
2	Physical Environment: Geology
	Introduction to Ecology
	Physical Environment: Soils and Landscape
3	Biotic Communities: Deciduous Forests
	Physical Environment: Weather and Climate
	Biotic Communities: Coniferous Forests
4	Biotic Communities: Aquatic and Marsh
	Wildlife Ecology
	Land Use Principles
5	Conservation Philosophy in the U.S. I
	Conservation Philosophy in the U.S. II
	Conservation in Action
6	Politics of Conservation
	Nature Teaching -- Workshop

Optional Courses:

Bird Life
Insect Life
Man in the Potomac Valley
Literature of the Potomac Valley
Rocks and Fossils
Geology in National Parks

Introduction to the Outdoors

I. Outdoor Living
Dress and equipment; caring for yourself; your outdoor neighbors.
Outdoor living as recreation: camping, hiking, canoeing.
Enjoying the things around you: bird study, photography; identification.

Field Trip 1: Nature study hike. Bear Island.

II. Natural and Wilderness Areas
Reading the landscape: ecology; ecological patterns; natural resource and conservation organizations.

Field Trip 2: Public recreation and conservation areas. To Shenandoah National Park. Overnight camp.

III. Inhabited Areas and Private Land
Inhabited areas as wildlife habitat and recreational areas.
Outdoor recreation: demand and supply; fishing, hunting, archery; wildlife management.

Field Trip 3: Use and conservation of inhabited areas. To nearby farms and conservation areas.

IV. Conservation and Education; Summary and Final Exam

Texts:

Osborn, Ben, 1965. Introduction to the Outdoors. Audubon Naturalist Society, Washington, D. C.
Storer, J. H., 1953. The Web of Life. New Amer. Libr., New York. Signet Key Book.
Watts, M. T., 1963. Master Tree Finder. Nature Study Guild, Napierville, Ill.

References:

Miracle, Leonard, with Decker, Maurice, 1961. Complete Book of Camping. Harper & Row, New York.
Riviere, Bill, 1961. The Camper's Bible. Doubleday & Co., Garden City, N.Y.
Smallman, R.E., 1965. The Golden Guide to Camping. Golden Press, N.Y.

Introduction to Ecology

I. Introduction
Ecology and its relation to other sciences.

II. The Ecosystem
The concept of the ecosystem; Habitat and niche; Ecocycles.

III. Energy in Ecosystems
Fundamental concepts of energy applied to ecosystem; Structure of the ecosystem; Productivity.

IV. Ecology of Species and Populations
Limiting factors and the ecology of individuals; Properties and dynamics of single-species populations.

V. Biotic Communities
Interactions between species; Concepts of the biotic community.

VI. Aquatic Ecosystems
Fresh-water ecosystems; Marine ecosystems.

VII. Terrestrial Ecosystems
Terrestrial ecosystems; Classification of North American ecosystems.

VIII. Applications of Ecology
Resource conservation and the human environment

Text:
Odum, E.P. and H.T., 1959. Fundamentals of Ecology, 2nd ed. Saunders Co., Philadelphia.

References:
Bates, Marston, 1960. The Forest and the Sea. New American Library, New York. Signet Science Library.
Bates, Marston, 1961. The Nature of Natural History rev. ed. Chas. Scribner's Sons, N.Y.
Commoner, Barry, 1966. Science and Survival. Viking Press, N.Y.
Farb, Peter and The Editors of Life, 1963. Ecology. Time, Inc., N.Y.
Storer, J. H., 1953. The Web of Life. New American Library, New York. Signet Science Library.

Wildlife Populations

I. Origin and Classification of Birds and Mammals
Origin of modern birds and mammals; Classification; Population phenomena; Species concept.

II. Characteristics of Species Populations
Variation; Natural selection; Hybridization; Isolating mechanisms.

III. Organization and Ecology of Species Populations
Survival; Mortality; Density; Reproduction; Predation; Competition.

IV. Dispersion of Populations
Density and dispersal; Migration phenomena; Bird migration; Orientation.

V. Geographical and Ecological Distribution of Birds and Mammals
Distributional barriers; Zoogeographic regions; Biomes and life areas; Trends and patterns in birds.

VI. Man and Wildlife
Extinction and reduction; Introduction; Habitat manipulation.

VII. Wildlife management practices
Law enactment and enforcement; Political aspects; Inventorying and harvesting; Game farms; Predator control.

VIII. Wildlife Conservation
Philosophy and psychology; History; State and Federal laws; Private organizations.

Texts:
Kendeigh, S.C., 1961. Animal Ecology. Prentice-Hall, Englewood Cliffs, N.J.
Mayr, E., 1942. Systematics and the Evolution of Species. Dover Publications.

References:
Allen, D.L., 1954. Our Wildlife Legacy. Funk & Wagnalls Co., N.Y.
Curry-Lindahl, Kai, 1964. Europe, a National History. Random House, N.Y.
Dobzhansky, T., 1955. Evolution, Genetics and Man. John Wiley & Co., N.Y.
Fisher, James, and Roger Tory Peterson, 1964. The World of Birds. Doubleday & Co., N.Y.
Leopold, Aldo, 1937. Game Management. Chas. Scribner's Sons, N.Y.
Life Nature Library. Time Inc., N.Y.
Carrington, Richard, 1963. Mammals. World Publishing Co., N.Y.
Farb, Peter, 1963. Ecology. Time, Inc., N.Y.
Moore, Ruth, 1962. Evolution.
Matthiessen, Peter, 1959. Wildlife in America. Viking Press, N.Y.
Milne, Loris and Margery, 1960. Balance of Nature. Knopf, N.Y.
National Geographic Society, 1960. Wild Animals of North America. Washington, D. C.
National Geographic Society, 1965. Water, Prey, and Game Birds. Washington, D.C.

Westmore, A., 1927. The Migration of Birds. Harvard Univ. Press, Cambridge.
Smith, Robert L., Ecology and Field Biology. Harper & Row, N.Y.
The Wildlife Society, 1963. Wildlife Investigational Techniques. Washington, D.C.

Land Use Principles

I. Elements of Land Use; Esthetic and Ethical Principles
Introduction and preparation; Definitions and premises; Elements of land use; Esthetic values of land; Ethics of land use.

II. Economic, Political, and Social Principles
Tenure and property rights; Value and Price; Use capacity; Succession in land use; Supply and demand; Public land; Public interest in private land: Social institutions that influence land use.

III. Ecological Principles
Concepts of ecology:
Ecosystem; Habitat and adaptation; Matter cycles and energy flow; Biotic communities: Dominance, succession and climax; Limiting factors and carrying capacity; Biotic potential; Balance of nature.
How land uses affect the ecosystem:
Cropland; Grazing land; Woodland; Wildlife and wildland.
The human environment:
Effect of human use on recreation and wilderness areas; Urban areas in the ecosystem; Relation of the human population to the ecosystem; Pollution of the environment; Eco-activism and the environment movement.

IV. Physical Principles: Conservation Planning
The nature of soils: The soil profile; Kinds of soil; Permanent and changeable properties of soil; Soil erosion processes: Water erosion, wind erosion, erosion control; Water and the land: The hydrologic cycle; Soil-water relationships; Water conservation; Conservation planning for the individual property.

Text:
Osborn, Ben, 1968. Land Use Principles; a Reading and Discussion Guide. Graduate Press.

Conservation Philosophy in the United States

I. Introduction and Orientation
Review of purposes and plan of the course; definitions of conservation and a conservation ethic; discussion of special interest of the class.

II. Historical Development of Conservation Concepts; Resource Problems in Western Settlement.

III. Development of Conservation Philosophy from broader perspectives, late 19th cent.

IV. Marshalling of scientific knowledge in support of a conservation ethic.

V. More complex personal philosophies; theological aspects.

VI. Conservation concepts applied to current problems; population, environmental contamination.

VII. Conservation Philosophy of (1) Hunting (2) Wilderness preservation.

VIII. Development of your own conservation ethic.

Texts:
Carson, Rachel, 1962. Silent Spring. Houghton Mifflin.
Leopold, Aldo, 1967. A Sand County Almanac. Revised, enlarged ed. Oxford.
Udall, Stewart L., 1963. The Quiet Crisis. Holt, Rinehart and Winston.

References:

Bates, Marston, 1960. The Forest and the Sea. Random.
Dasmann, Raymond, 1965. The Destruction of California. Macmillian.
Graham, Frank, 1970. Since Silent Spring. Houghton, Mifflin.
Lowenthal, David, 1958. George Perkins Marsh. Columbia.
Matthiessen, Peter, 1959. Wildlife in America. Viking.
Osborn, Fairfield, 1948. Our Plundered Planet. Little, Brown.
Powell, John Wesley, 1962. Report on the Lands of the Arid Region of the United States. Harvard.
Sears, Paul B., 1935. Deserts on the March. Oklahoma.

Conservation in Action

I. Conservation in action on Federal and Military lands. Citizen action through national and local conservation organizations.
Field Trip: Conservation in action under multiple use policy - George Washington National Forest, U. S. Forest Service.

II. Conservation in action on privately owned lands, rural, suburban, and urban. Conservation in action in watershed protection, river basin planning, water resource management.
Field Trip: Culpeper (Virginia) Watershed project and conservation in action on rural lands.

III. Urban planning and natural resource. Conservation in action in urban planning. Toward a national land-use policy; land-use regulations based on soil and water resource conservation.
Field Trip: Columbia City (Maryland) - Conservation of natural resources and land-use planning in the new-town concept.

IV. Resource use and management for community improvement. Conservation in action for the future - Where to get help for what in citizen action programs.

A Program Conducted by a Community College

William H. Schmidt

Why should a person living in a relatively small, agriculturally-oriented community in central Iowa spend two hours an evening once a week, January through March, attending an adult education course dealing with our environment?

One facet of the answer to this question evolves from the relatively short history of this area as an explored and settled region. Less than six generations ago, Lewis and Clark explored this raw, untamed wilderness, where today 20 million people are living in a mid-America converted to fields, super-highways, factories and shopping centers. The Iowa where Indian tribes once freely roamed is now 85% cropped and 99% privately-owned land. A kingdom of nature has become an empire of man, but our wilderness heritage still holds a special delight and fascination for us.

A second, related question might be asked. Is there any need for an environmental course in a farm-oriented community?

Certainly many members of a rural community are closely attuned to the land and are perhaps more likely than most citizens to appreciate their environment. It is very easy, however, to overlook the fact that among all of America's giant industries, the marvels of a machine-oriented world, none has undergone greater technological change or development than has agriculture. Those close to such rapid and massive change often come to share a basic concern of the professional ecologist, the possibility that continuous wholesale change can outstrip our abilities to evaluate adequately and to understand complex chain interactions in the delicate balance of a living world.

William H. Schmidt, Chairman Biology Department, Ellsworth Community College, Iowa Falls, Iowa.

Today the interest in environmental education of a small community in a predominantly agricultural setting is as great, and should be, as in any metropolitan area or, conversely, in any wilderness area. With differences in locale, problems may vary in type and intensity, but there is no change in the need for educated solutions to them.

AN ENVIRONMENTAL COURSE

During the winter of 1973, a course, "Environmental Quality in the 70's," was offered through the Ellsworth Community College adult education program to interested persons in the Hardin County, Iowa, community area. Planned for a 10-week period, it drew enthusiastic support from students and participants.

Interacting Components

An environmental education program for adults offered by a community college may combine a number of basic ingredients. Obviously, the institution itself is important. The growth of the community college movement in our country and its unique commitment to serve specific needs of people in the community where it is found make it an ideal vehicle to translate the general educational needs of the nation into specific, problem-oriented, continuing education activities.

Founded in 1890, Ellsworth is a comprehensive community college in the Iowa Valley Community College District. Though a small institution (under 1,000 full-time students), its enrollment has more than quadrupled in the last 10 years, with adult education courses presently the fastest growing single segment of the total district offering. Over a number of years, it has had a significant part in the maturation of the community's environmental concerns.

But a very important point must be emphasized. Historically, many of the most

important steps in development of elementary and secondary environmental education evolved directly or indirectly as a result of dedicated individuals or conservation-oriented groups (public and private), whose jobs were outside the formal education structure. Concerned citizens realized the need for environmental training for our youngsters, the leaders of tommorrow. Today, those same citizens and resource managers at every level are recognizing that we may not have time to wait until some of our children's environmental education rubs off at home; changing directions on a national scale requires educational effort at every level, including adult education.

The development of the course "Environmental Quality in the 70's" draws a parallel to previous experience. It was not an isolated achievement of Ellsworth College or the faculty involved. Rather, the faculty offered primarily a coordinating function; the institution made possible a forum for assembly and discussion of topics. Thus, in our experience, the second, and indispensable ingredient, in terms of organization and development of the course, involved cooperative efforts of individuals and representatives of organizations in the community who had been working with the environment and environmental education for many years. The availability and quality of cooperation in the American community and the values inherent in using local resource agencies cannot be overstressed.

Organization

A brief outline of organization steps is illustrative, and, for those concerned about the complexities of offering such an environmental course, may prove encouraging in the simplicity of overall approach.

Though inception of the course was the long-term result of many informal discussions among a number of persons, the first formal action was the organization of a coordinating committee, all members of which had given active support or had participated in previous environmental education programs. Key individuals included Hardin County Soil Conservation District Commissioner; SCS District Soil Conservationist; County Extension Director; and the Executive Director of the Hardin County Conservation Board, in addition to Ellsworth College representatives.

Only two formal meetings were needed to bring consensus on the content and major thrusts of the course. A third and final meeting was devoted to basic mechanics of the course and decisions on preliminary publicity.

A very fortunate circumstance, which greatly expedited the introduction of the adult course, was a working knowledge by the committee of the preliminary manuscript for the adult education teaching guide developed under the auspices of the Soil Conservation Society of America by Bernard L. Clausen and Ross L. Iverson. This basic guide, "Environmental Quality and the Citizen" conditioned development of most of the major objectives of the course.

Developmental Principles

Several decisions by the coordinating committee provided a strong central fabric of guidelines which not only proved efficient in application but also allowed certain adaptations within the course.

A sobering fact concerning environmental education is that no single person can become expert in all aspects, or even most aspects of the area. By its very nature interdisciplinary, the subject is problem-oriented, and there are few simple solutions. Scientific and technological data must be tempered by insight into economics, human behavior, political influences, sociology and many other non-science areas. Hence, it was agreed that no one person should be required to shoulder full responsibility for teaching such a course. Rather, once general topics were agreed upon, the committee pooled the knowledge of available specialists in each field. In some cases these resource people were state agency or extension experts; in others they were county or area personnel; in others they were panels of civic or group leaders (Table 1). Specialists were grouped according to topic, and members of the coordinating committee volunteered to make the contacts necessary to complete the schedule. Though a simple procedure, this greatly reduced administrative workloads - reaching 5 or 6 speakers for three topics is much different from contacting 25 speakers for 10 topics.

A second unanimous decision of the coordinating committee was that any adult education program which was to be viable and attractive, and yet fulfill needs in a community, could not present only state and national issues and problems. In recent years various agencies and groups have done an excellent job of reaching the public at large through the mass media with a profusion of pamphlets and tracts, new magazines and books, special news coverage, and every form of television coverage from spot announcements to documentary films. These are necessarily of general interest and are designed for the largest possible audience. It was felt that this course could be much more meaningful if it extended that interest to basic local concerns. One of the few constraints placed on speakers in pursuing a topic was that they must gear the topic to the situation as it applied in Hardin County. Without exception, the most intense discussions developed when students were able to become involved through direct question and answer exchange with policy makers at the local level.

Finally, a third major concern was to provide a saleable package in a marketplace which is furiously competitive for the attentions of potential students. One rather basic idea intended o.lginally as a promotional concept allowed for several modifications that resulted in a more adaptable course.

In many instances, resource agency personnel, elected officials, and other specialists willing to teach some sessions donated their time. It was suggested that the rather minor expense incurred in offering the course could be defrayed by sponsoring organizations, making possible a free course for students.[1] Educationally, and in terms of organization, this pattern allowed for flexibility that would otherwise have been rather difficult.

(1) Much of the busywork involved in registration, enrollment, and payment of fees was eliminated. A relatively informal, friendly, townhouse-meeting sort of atmosphere was possible from the outset. In addition, elimination of paperwork problems made possible a minimum waste of time and dilution of effort. The ability to get directly to the heart of the subject was a key factor in attracting and holding attention.

(2) It is generally agreed that adult learners represent a great variety of backgrounds and experential exposure and, consequently, could be expected to exhibit varying degrees of interest in the range of topics presented. Acting on this assumption, essentially self-contained units were developed for each topic. Since no fees were involved, it was possible for students to attend any or all sessions with little problem concerning loss of continuity or level of understanding. While one might logically fear that a lack of commitment would lessen attendance, the opposite seemed to hold true. Sampling seemed to prove an enticement rather than an inhibition.

Evaluation

At every available opportunity during the progress of the course, informal evaluation was solicited from participating speakers, discussion leaders, and the coordinating committee, as well as the students. In addition, a simple one-page questionnaire was handed to the group during the last class. Replies were very positive in endorsement of structure, educational value, and practical application of the sessions. Even more encouraging was the almost unanimous endorsement of continuation of this type of offering and the variety of suggestions for additional topics to be included in succeeding courses.

Evaluation of learning outcomes is often difficult, but an interesting example might be cited. In many years' experience teaching a college class in environmental biology, one of the most difficult tasks has been to achieve a teaching strategy that would involve more than a superficial student realization of the fact that economics, politics, and social factors are important in the formulation and finalization of environmental decisions. Thus, one of the most satisfying aspects of the course involved the discussions which developed when panels of local officials and civic leaders spoke to the group. It is a commentary on the modern impact of mass media that the men and women who determine and carry out policy on the local level -- County Boards of Supervisors, Iowa's unique County Conservation Boards, Park and Planning Commission members, even city managers and councilmen--are less well known to the public than state and federal representatives.

Interaction with these groups occurred on the broadest scale, ranging from sharp exchanges on such specific topics as septic tank pollution and real estate promotions to rather erudite philosophical and historical consideration of government's role in local problems and long-range city and local planning. Confrontations such as this brought the role of politics into sharp focus, but also immeasurably broadened the students' understanding of federal and state regulations and the local economic constraints within which even the most visionary and dedicated public servants must work. Interesting as student reactions to confrontations such as these were, reactions of panel members were equally gratifying. There is something electric in groups of voters and their representatives probing and thinking through common problems of a community with a view toward cooperative change rather than the impersonal, but more typical, "write a letter" or "go through channels" approach.

Extension and Implementation

A single successful experience should not be interpreted as an indication of overall expertise, but it may provide reinforcement for germinating ideas or add emphasis to opinions. Within that premise, some suggestions may be considered.

(1) Do offer a course on the environmental concerns of your community; there is little question that there is a need. It is often unrealistic to wait for state and regional coordination or direction. The local community is the key. A coordinating committee can prove a very effective tool.

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1 In terms of replication or extension of a course, such a procedure must be recognized as somewhat hazardous, but it should be considered as an effective opening wedge in developing a course.

(2) Do use resource people who are already available in every community. A number of speakers and discussion leaders can give needed depth to topics under consideration if they have expertise born of special training, or have special knowledge, interests, or responsibilities in an area. By making use of many speakers, the courses can provide topic overlap. This is one rather effective way of achieving an interdisciplinary approach and at the same time promote balance and perspective in the points of view presented. Each speaker will bring a distinctive style, personality, and technique to everything from general topic approach to audio-visual methods employed. Representatives of resource agencies or special interest groups often can obtain brochures, pamphlets, and other materials germane to their topic. All of this will contribute to interest and educationally provides one answer to the diverse needs and learning styles of the typical adult audience.

(3) Do coordinate carefully. Overstructuring and slavish attention to detail can frighten even the most stalwart advocates during the early stages of development of a course in a field as complex as human ecology, and too much dominance and direction will dull speaker motivation and stifle fresh approaches.

However, with a confederation of leaders such as our program utilized, there must be at least an outline or pattern which indicates how the whole course fits together and which directs attention to those common elements which must be emphasized to provide cohesion and promote desired learning outcomes.

One of our leaders in his evaluation suggested that, as a long-range goal, a comprehensive study book be developed for student as well as leader use. A particular benefit of such an approach would be the ease with which a progression of courses or special projects might be developed in response to participants' requests. In addition, topic leaders could more easily make suggestions in the direction of their interests, and participants might well be motivated to move from environmental awareness to environmental action programming.

(4) Do publicize. A cross-sectional analysis of our students revealed the great variety of ages and interests. All age levels ranging from 15 to 75 were well represented in the group. High school and college students, teachers, a number of housewives, farmers, several local businessmen, and, in addition, even professionals from the various environmental areas were in regular attendance. Adjoining small towns and many of the outlying areas within a radius of 20 miles were consistently well represented in the group, even with the problem of driving in winter weather. The key to such great diversity, especially in smaller communities, is effective publicity.

In addition to conventional college news releases, local radio and other news media will often provide free publicity. One ingenious member of our coordinating committee, by emphasizing the independent unit course concept, was able to secure front page listing of topics and speakers in local newspapers and to schedule spot radio announcements for the entire ten weeks of the course. Well-known speakers often attracted special news coverage. Additional or alternate communication outlets may be developed through coordinating committee contacts within the local community. And, finally, the pipeline of person to person interaction should not be overlooked.

The simple teaching device of providing a short preview of the next week's activities at the close of each session was intended primarily to maintain continuity, motivate, and sustain interest for students already in the course. It was discovered, however, that it also served to develop "missionary" students who brought friends with special interests corresponding to the upcoming topic.

THE OUTLOOK

The development of a new environmental awareness in a nation of hurried people is a difficult process. In our community a sense of pride and cooperation has grown gradually as new milestones have been reached--new classes in environmental education in the high schools, coordination of annual field days for over 1,000 Hardin County 5th graders, the successful fight to prevent a Corps of Engineers dam across the scenic Iowa River gorge, the continued effort to preserve a bit of historic Iowa through a "Green Belt" along a beautiful segment of the Iowa River--all of these have deepened the resolve and concentrated the efforts of individuals in our community.

But catalytic reactions are necessary if voters are to make those intelligent environmental decisions which not only affect our nation today but will determine the world of tomorrow.

The development of evening programs on environmental quality can be such a catalytic reaction in your community. A combination of local and state leaders, teachers, students, businessmen, politicians and farmers working through problems to preserve their common heritage is a challenge. But it is also an experience that will strengthen community understanding, and it can consolidate community spirit as citizens work together, not only for the benefit of this generation, but for future generations as well.

TABLE 1. ENVIRONMENTAL QUALITY IN THE 70'S

Moderator: William H. Schmidt Coordinated by: Ellsworth Community College, Hardin County Extension Service, Hardin County Conservation Board, Hardin County Soil Conservation District.

TOPIC	INSTRUCTOR
Introduction to Conservation Education	Ross Iverson, Staff Member, U. of Northern Iowa Summer Conservation Camp; Joe White, Agriculture Instructor, Ellsworth Community College.
Space and Land	Kermit Voy, Soil Scientist, Soil Conservation Service; Dick Bassett, District Conservationist, Soil Conservation Service; Dean Miller, Soil Conservation Technician, Soil Conservation Service; Joe Shore, Soil Conservation Aide, Hardin Soil Conservation District.
Water and Air Resource Development	Don Nolting, County Sanitarian, Hardin County Board of Health; F. R. Pfeiffer, Regional Engr., State Dept. of Environmental Quality; Edward J. Stanek II, Regional Representative, State Dept. of Environmental Quality.
Perspective on Pollution	Peter Cotton, City Manager, Iowa Falls, Iowa; Charles Davis, Editor, Iowa Falls newspaper, chairman, Waterfront Committee; Jerry Welden, local businessman, member, County Conservation Board; Kenneth Eldred, Manager, Iowa Falls Waste Disposal Plant.
Food and Fiber	Jim Johnson, County Extension Director, Hardin County Extension Service.
Mineral Resources and Energy Sources for the Future	Fred Dorheim, Economic Geologist, State Geological Survey.
Population Stress	Jim Francis, Resource Development Specialist, Extension Service.
Home Grounds Beautification	Jim Johnson, County Extension Director, Hardin County Extension Service; Gene Neven, County Extension Director, Marshall County Extension Service; Irwin Burns, Assistant to Executive Officer, Hardin County Conservation Board.
Quality Environmental Planning	Jake Whitehead, Chairman, Hardin County Board of Supervisors; Leo Knight, member, Hardin County Board of Supervisors; Carl Lettow, member, Hardin County Board of Supervisors; Harold Luiken, Hardin County Conservation Board; Caleb Knutson, Vice Chairman, Hardin County Soil Conservation District.

A Program Organized by a Community Adult Education Facility

David L. Cross and Robert W. George

Pressures resulting from the continual degradation of the environment have brought about need for a better understanding and better communication between the citizenry of the nation and their local, state, and federal agencies. A definite need existed to develop programs in the affective area which stressed self-worth of the individual and the relationships among those agencies responsible for the task of recommending and monitoring environmental programs.

Through efforts exerted at local and state levels a committee was formed to develop and recommend a program to identify these issues. The committee, made up of representatives of local citizens through local club affiliations local education institutions, and city and state agencies, accepted this challenge.

Neilsen Hansen, Director of the Lansing School District Continuing Education Program, and Vic Horvath, Education Specialist, Department of Natural Resources, state of Michigan, served as co-chairmen for the committee.

As a result a program titled "Our Ecological Dilemma" was developed in January, 1970, through a cooperative effort between the Lansing School District Adult Education Program and the Department of Natural Resources, state of Michigan.

The program took the shape of an adult education course with instructors drawn from the key resource people in the Greater Lansing community who were able to share knowledge, attitudes and concerns, together with skills, to help students face up to the environmental dilemma.

A major emphasis was placed on the possible and alternative solutions to problems. The course was designed as a series of seminars with opportunity for group discussion, plus informal interaction among individuals sharing their concerns.

The seminars were aimed at the decision makers of the Greater Lansing community. Emphasis was placed upon stimulating thought and discussion relative to man's use and abuse of his environment and motivating action for solutions to these problems.

The pilot course was developed to include a proposed pre-registration form and was advertised through direct contacts and mailings to organizations, agencies, and local citizens to help determine the levels of interest.

The committee worked diligently to reach all segments of the community. Those contacted included a broad spectrum of interests.

The objective was twofold. First, to get reaction to the proposed course offering in terms of content, time, etc., and second, to get a pre-registration indication of the extent of interest -- the potential representation of different interests from the community. (See Appendix)

Results were most gratifying with individuals and groups showing great interest, and with a number of organizations offering both participation and other support.

The program in final form consisted of nine seminar sessions led by presentors knowledgeable in subject areas. The nine sessions were followed by a citizen action panel to consider ways that they as individual citizens could become involved in solving environmental problems of their community. To reinforce the total program, a special Saturday tour was arranged to see first-hand some of the

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David L. Cross, Science and Environmental Education Program Coordinator, SEE Center, Lansing Public Schools, Lansing, Mich. Dr. Robert W. George, Associate Professor, Environmental Conservation Education, College of Agriculture and Natural Resources, Michigan State University, East Lansing.

opportunities for coming to grips with "Our Ecological Dilemma."

The Program was as follows:

Man and His Environment
Dr. John Cantlon, Provost, Michigan State University.

Pollution of Our Atmosphere
Mr. C.W. Pesterfield, Lansing Air Pollution Engineer.

Pollution of Our Waterways
Mr. Carlos M. Fetterolf, Chief, Water Quality Appraisal Unit, Michigan Department of Natural Resources.

Environmental Planning
Mr. Raymond C. Guernsey, Planning Director, City of Lansing.

Pests, Pesticides and People
Mr. Paul Flink, Forest Entomologist, Forestry Division, Michigan Department of Natural Resources; Mr. John Calkins, Chief Deputy Director, Michigan Department of Agriculture.

Recreation Today and Tomorrow
Mr. Glenn Gregg, Deputy Director for Recreation, Michigan Department of Natural Resources.

Pride and Beautification
Mr. Theodore Haskell, Assistant Director, City of Lansing, Parks and Recreation Department.

Grand River Watershed
Mr. John Kennaugh, Executive Secretary, Grand River Watershed Council.

Waste Disposal, Solids and Liquids
Dr. George P. Graff, Natural Resources Manager, Michigan State Chamber of Commerce, Lansing.

Citizen and Community Involvement
Panel consisting of: Mrs. Merrill Petoskey, representing Garden Clubs; Mrs. Edwin Shelby, League of Women Voters; Bernard Ansley, Michigan United Conservation Clubs; Carlos Fetterolf, Michigan Association of Conservation Ecologists; Rodney Smith, Michigan Conservation Education Association; Moderator, Einer Olstrom, Extension Program Leader, Michigan State University, East Lansing.

Tour - (Saturday morning) - Bus trip around Greater Lansing area to visit water treatment plant, shopping centers, urban renewal area, Grand River, highway construction, etc.

The heart of the program was the selection of resource people who were knowledgeable and had the ability to communicate effectively and who were interested in working with the program.

It should be recognized that the instructors for each of the sessions were local resource people representing Michigan State University, state agencies, city government, and citizen groups.

Further efforts to advertise the course were made through continued distributions of announcements through local clubs and school districts, and by means of radio, TV, and newspapers.

Eighty-eight people enrolled for the course, paying the registration fee of $8.00. The special rate of $12.00 per couple attracted 15 couples to the course.

Attendance at each seminar session ranged from 75 to 150 people. The variation in attendance apparently resulted from special interests of associates of organizations or agencies teaching a particular seminar session.

EVALUATION

No formal evaluation was made during the course. At the completion of the course, there was favorable participant reaction and interest in additional courses. The following points of interest relating to evaluation were made by the program chairmen:

1. Even though the program emphasized environmental problems and possible solutions, the most apparent gains made were the cooperation developed among participants from all walks of life, from housewives to department chairmen from major universities.
2. Encouragement was given to individual leadership abilities, but all who attended received reinforcement in their opinions.
3. Participants obviously became more aware of their own local environment and developed new concerns for action.
4. Agency, club, and group involvement helped make the course a success. As groups became involved, they alerted all their members.
5. Program design may be useful for other groups to consider. The idea of a "course" for adults with such a program design can be useful to other communities.

Recommendations

1. There should be regular on-going group evaluation of each session of the program.
2. Future planning should allow for continuation of the present program with new programs developed for past participants.
3. Develop future programs designed to further local citizen participation in program development and program presentations.

Other Programs

In addition to the Adult Education Course, "Our Ecological Dilemma," there are a number of programs dealing with the environment. Influences of the Adult Education Course may not be readily identified in the operations of these programs, but it did play an observable role in the awakening of public concern and increased receptiveness to environmental programs and activities. The following programs in the Greater Lansing area reflect current environmental awareness and concern:

Carl Fenner Arboretum Park - offers many study areas within the 120 acres of forested hills and rolling open land, including a swamp, forest, marshy thicket, and two ponds. A naturalist arranges tours and programs for all age groups including school classes, provides for seasonal displays and lectures on topics of interest for the total community. Supplementary materials are available, together with a monthly newsletter. Contact person: Mrs. Joan Brigham, Naturalist, Department of Parks and Recreation, Lansing, Mich.

Lansing Schools Conservation Club - encourages environmental studies through workshops for club members, teachers, and employees. Club fund raising activities provide scholarships for teachers and students at conservation schools and camps. Designed to serve all teachers employed with the Lansing School District. Contact person: William Barnes, President, 500 E. Thomas Street, Lansing, Mich. 48906.

SEE Center - The Science and Environmental Education Center promotes and supports programs directed by the Lansing School District for students, parents, and teachers; arranges weekly camping programs for K-12 students throughout the school year. The camp is presently being operated at Tall Timbers Camp, Climax Mich.

Recently the Lansing School District purchased a 158-acre site for the camping program which is now being developed to handle 200 students per week on a yearly basis. The camping program will involve students, teachers, administrators, and parents.

Summer school activities of the SEE Center provide credit in Environmental Education through Field Ecology Programs for elementary, junior high, and senior high age groups on a voluntary basis. The Field Ecology studies include both classroom and field work.

Canadian Wilderness Field School offers through the SEE Center to 14 - 18-year-olds a one week experience at Quetico National Park Canada. Participants are required to complete 20 hours of instruction prior to the trip.

A major emphasis of the SEE Center is Teacher enrichment and reinforcement, through:

(1) Loan Materials for classroom and field experiences for all grade levels. These materials may range from field test equipment to ecology game packets.

(2) Newly developed programs and materials are available for teacher examination. Efforts are made by the Center to keep abreast of recent materials, either equipment or printed materials, dealing with the environment.

(3) Inservice Training - for any environmental education program requested throughout the district. Inservice programs may be developed through mini-workshops, regular course workshops, or college credit workshops offered in the local area. Many of the workshops are co-sponsored with other subject curriculum areas.

Descriptive Materials Available from the SEE Center:

"Science and Environmental Education Guide", 1972. 175 pages, $8.00.
"Environmental Education Community Resources Handbook," 1973. 204 pages $9.00.
"K-12 Environmental Education Interdisciplinary Curriculum Guide," 1973. 247 pages, $9.00.

Contact person: David L. Cross, Coordinator, 3426 S. Cedar Street, Lansing, Mich. 48910.

Woldumar Nature Center - under the leadership of Nature Way Association of Lansing, made up of concerned citizens, conservationists, educators, and civic groups, includes 188 acres of aquatic, field, and forest habitats, that serve as a conservation education center and outdoor laboratory open to all persons in the Tri-County area. The Woldumar Nature Center offers the following programs:

(1) Field Trips - offer school children of the Tri-County area environmental experiences under the guidance of a naturalist. General or specific subject programs are available.

(2) Camp Discovery - is a natural history field school offered to children from ages 5 to 12. It is open in the fall, winter, and spring for five sessions on consecutive weekends. In the summer it operates on a weekly basis.

(3) Inservice Programs - are co-sponsored by Woldumar Nature Center with Lansing Schools Conservation Club, SEE Center, and other organizations, using the Woldumar study sites and facilities.

(4) Mrs. Milliken's Conference - Michigan's First Lady takes an active role in the annual conference organized about the concept of student involvement. Eighty to 100 high school students, selected from the Tri-County area, meet with resource people from local agencies, such as the Department of Natural Resources, to consider environmental projects they can work with in their own communities. Mrs. Milliken was a participant in the Adult Education Course, "Our Ecological Dilemma."

(5) Perception Center - Woldumar Nature Center has recently initiated plans for a perception center designed especially for the handicapped of the Tri-County area. The center is to be developed on 20 acres of land surrounding the buildings at Woldumar. Teaching

plazas with central themes (i.e. geology, pioneer plants) are planned as part of the learning experience for handicapped K through 12 students, teachers, and college students. The Center is financed through the cooperative efforts of many civic agencies, organizations, and private citizens.

Woldumar publishes a monthly newsletter, and has available numerous publications and materials relating to environmental concerns in the Tri-County area.
Contact person: Dr. Richard Snider, Director, 5537 Lansing Road, Lansing, Michigan 48917.

SUMMARY

A program organized by the people can make a contribution to the total community environment.

Such a program is worthy of continuation and expansion. Especially to be noted is the possible relevant application to any community in Michigan --- or in the nation.

People concerned about the environment can find support for action through their local community adult education facilities and their local resource talent bank. We strongly recommend it. Try it, you'll like it!

APPENDIX

Tentative Schedule 1970

CONTINUING EDUCATION SEMINAR
sponsored by the

LANSING SCHOOL DISTRICT CONTINUING EDUCATION DEPARTMENT

"OUR ECOLOGICAL DILEMMA"

Description of Seminar: A seminar offered to all adult citizens of Greater Lansing to stimulate discussions about man's use and abuse of his environment and the motivation toward solutions of these problems.

DWIGHT RICH JUNIOR HIGH SCHOOL - SMALL AUDITORIUM
Tuesday evenings 7:30 - 9:30 P.M.

1.	January 13	Ecological Dilemma or Man and His Environment
2.	January 20	Pollution of Our Atmosphere
3.	January 27	Pollution of Our Waterways
4.	February 3	Environmental Planning
5.	February 10	Pests, Pesticides and People
6.	February 17	Recreation Today and Tomorrow
7.	February 24	Pride and Beautification
8.	March 3	Grand River Watershed
9.	March 10	Waste Disposal, Solid and Liquids
10.	March 17	Citizen and Community Involvement

MARCH 21 (Saturday Morning) -- Bus trip around Greater Lansing area to visit water treatment plant, shopping centers, urban renewal area, etc.

REGISTRATION

Enclosed Fee _____ (amount) for _____ (number) enrollments @ $ 8.00 (@ $12.00 per Couple)

Course Title: "OUR ECOLOGICAL DILEMMA"

Mr.
Mrs. _____
Miss Last Name First Name Telephone

_____
Street Address City Zip Code

A Program Focused on a Specific Resource Management Problem

Wendell Thacker

The private individual concerned with an environmental problem he cannot solve alone must find out where and how to get help, whether through cooperative action with other citizens or from public agencies.

Public agencies, on the other hand, must determine (1) how to stimulate people to act without costly delay and (2) how to instigate action and educational programs needing the input of many agencies and organizations.

In many situations both public and private actions are necessary. Saline seep -- a resource management problem of recent origin on nonirrigated lands in the semiarid plains of the United States and Canada -- is just such a problem.

The term "saline seep," as used in this paper refers to a special phenomenon that deteriorates nonirrigated lands as a result of agricultural management practices.

To understand the nature of the problem it is helpful to know how saline seep develops. (See Figure 1.)

Soils of vast areas of the Northern Plains, which includes the state of Montana, are underlain by impermeable materials, usually shale, at depths varying from a few inches to more than 50 feet. Typically, the substrata of soils in this region contain a significant amount of salts, including sodium, many of which are readily soluble in water.

In undisturbed conditions, the salts gradually leach downward and remain nearly stationary. Climax vegetation usually makes use of each year's precipitation before any water passes beyond the root zone.

Until about 1930, farmers planted a crop each year on nonirrigated land. This used all of the annual precipitation, much as climax vegetation did.

But since the 1930's the general practice in agriculture has been to crop half the land each year and summerfallow the other half. This practice increases the stability of the agricultural enterprise, but it also helps open the way for development of saline seep. Under this system, plants grow on the land about 3 months out of a 2-year period. During the other 21 months, precipitation sometimes supplies more water than can be stored in the root zone of small grain crops. This excess water leaches downward, picking up a load of dissolved salts, and eventually builds a water table, causing water to seep to the surface with its load of salts at some point where the soil mantle over the shale is relatively shallow, or wherever the water table rises near the surface.

Saline seep appeared on a few farms by 1940. By the mid-1950's, it had become a general problem in some areas, and by 1970 nearly half the cropland on some farms had become unproductive, due to the increasing number of seeps.

Because the increase in saline seep was obviously a product of man's activities, stopping or correcting the problem would require that people become aware that land use practices would have to change. Action waited on two essentials: 1. A general understanding of the cause, effects, and potential for continuing damage from saline seep, and 2. An economic means of control, prevention, and reclamation of damaged areas.

As early as 1940, SCS district conservationist at some locations were talking with farmers about the potential damage. Montana Extension Service specialists made field investigations in 1947, and later studies confirmed the early diagnosis of the problem and indicated that subsurface drainage has little practical application in saline seep control.

Wendell Thacker, Area Conservationist, Soil Conservation Service, Great Falls, Montana.

The solution lay in managing the land in such a way that plants would use precipitation where it entered the soil and thus prevent water transport of salts to the surface as seep areas. Studies also showed that lateral movement of salts through soils could pollute ground and surface waters, including wells needed by farm homes.

The first move toward group action came about in 1968 when Soil Conservation Service and Extension Service agronomists, in an effort to stimulate inter-agency action through the framework of the State Committee for Rural Development (CRD), prepared a questionnaire to be sent to farmers in Chouteau County, Montana.

It was anticipated that the data collected would be used in information provided to the news media, but the questionnaire produced an important result that was not anticipated. It stimulated interest and discussion among the farmers and led eventually to action when the Highwood Alkali Control Association was organized with 75 members who assessed dues to publish a newsletter, buy a rain gauge, and help pay for aerial photos to aid in research.

Through the CRD organization a conference of agency and university technical people in Montana was organized. Three farmers in the area asked to attend the meeting, and their presence proved to be a turning point in efforts to gain support for a program to control saline seep. The farmers added an element which no agency person could have supplied as effectively---a sense of urgency about the problem from the farmer's standpoint and their willingness to accept help.

Four months after the conference, a plan of action was developed, and the Saline Seep Research project was inaugurated. A CRD subcommittee prepared and distributed an information pamphlet that brought to the attention of many other farmers the possibility of controlling saline seep. The Highwood Alkali Control Association, and later the Teton Ridge and Pondera associations, adopted the term "alkali" commonly used among farmers instead of "saline seep" more for the sake of brevity than accuracy. Arable soils of the area contain minor amounts of sodium, but due to the high solubility of compounds of sodium, seep water may contain significant amounts of sodium, and on occasion develop alkali soil problems, hence the common usage of the term "alkali" to include all seep areas.

Once the action was begun with farmers actively participating, assistance was obtained from Montana State University, Montana Bureau of Mines and Geology, and Agricultural Research Service in gathering more information. Agricultural Stabilization and Conservation

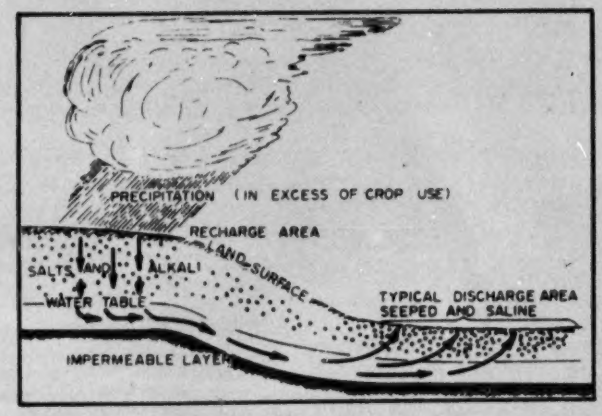

Figure 1.

Service was petitioned for a change in program regulations that would permit annual cropping designed to control saline seep, and this change received the approval of the Washington office.

As farmers took part in the informal association activities, they soon saw the advantages of a legal organization through which they could work; in 1970 they formed a special project under the 1969 revision of Montana Conservation District laws.

It is significant that once the education process, by means of written materials and workshops on saline seep, had brought to the attention of farmers and other segments of the public the cause, effect, and possible control of the problem, citizen action followed. Beginning with informal meetings and the development of goals, the action programs resulted in the formation of a legal organization with the power to levy taxes for the continuation of programs, and the organizational strength to seek governmental assistance with assurance of continuing action on the part of the land owners.

To illustrate the wide local, state, and Federal coordination that took place, consider the number of agencies and institutions that participated: Chouteau County Conservation District, Montana State University, Montana Agricultural Experiment Station, Montana Bureau of Mines and Geology, Cooperative Extension Service, Agricultural Research Service, Agricultural Stabilization and Conservation Service, Farmers Home Administration, Soil Conservation Service, Chouteau County Commissioners, Economic Research Service, and the news media throughout the state that further disseminated information on the activities of the groups working on the problem.

Recent Developments

Saline seep occurs in a large area of Canada, also. Agricultural people in Canada are following U.S. activity and some attended the Great Falls workshop. They held their own workshop in January, 1973, with several Montanans on their program. Six months later, 40 Canadian agricultural advisors, scientists, and farmers made a 2-day tour by bus of Montana's saline seep areas and the Highwood research project.

In response to a Joint Resolution passed in 1973 by the senate and house of Montana's state legislature, Governor Tom Judge appointed 15 Montanans to a Governor's Emergency Committee on saline seep.

The committee is directed to "marshal all available resources, including federal aid, to develop and execute comprehensive plans, special research, and education to prevent further destruction of Montana's natural resources in soil, water, and wildlife by saline seep."

With the full power of the Governor's office behind it, the Emergency Committee is seeking cooperation of all the states having the problem and fuller participation by the Federal government. It occupies the best position to date for real leadership and coordination of action to deal with saline seep.

Much has been accomplished toward understanding and dealing with saline seep during the past 5 years. But the biggest part of the job still lies ahead.

SUMMARY

Several observations can be made of the saline seep control movement that may be of value in similar endeavors.

1. Don't underestimate the importance or overlook participation of the private citizen. The average person does not realize how much can be accomplished by group action until he becomes involved. Many projects that failed in the past might have succeeded if more citizens had been fully informed.
2. The problem or need must be real; it must be important to many people.
3. Every agency and organization needs to recognize that cooperation is essential. There must be administrative sanction, and direction between agencies and between agencies and organizations, that make clear to every employee that this is part of his individual job responsibility; that he is allowed to make shifts in priorities to accommodate it.
4. There must be enough leadership to provide continuity. In the saline seep movement this was provided in several ways. The university assigned a research coordinator. The Alkali Association elected officers. Overall coordination has been provided by individuals who voluntarily assumed their roles in the absence of any assigned leadership.
   The role of overall coordination is one which agency personnel frequently need to fill if cooperative efforts are to be accomplished. Agency administrators can assist by making formal or informal assignments to staff members, either within their agencies or in concert with other administrators.
5. A great deal of adult education can be done by the public at large, through their own organizations at the community and neighborhood level. Agencies must learn to stimulate this process if environmental and conservation objectives are to be achieved.

Role of the Natural Resource Specialist in Adult Education

Delmar Janke

Introduction

As we are all aware, there are many questions being asked, considered, and more or less satisfactorily answered about the quality of life and of the ecological environment at the present time. The role of the natural resource specialist in addressing the scientific and technological aspects of the quality of the ecological environment is evident -- but does he have a further obligation or opportunity to insure that wise courses of action are pursued in dealing with the quality of the environment? He certainly has the opportunity to deal with the topic of the quality of the environment outside of his "narrow" professional responsibilities and I believe that he has the obligation to do so. As Potter (5) has indicated, the professionals in an area are the persons most qualified to explain the alternatives available and to apprise laymen of the consequences of taking various courses of action available in solving a given problem. This is one area in which I believe the role of the natural resource specialist is most important in adult education. Another area which must be included in the role of the natural resource specialist in adult education is that of helping adults develop what Aldo Leopold (4) has identified as a land ethic.

Questions to be Addressed

In this paper I would like to address three major topics: 1) How can the natural resource specialist help assess the problems and resources in his community so that a realistic educational program can be established; 2) What type of adult educational programs might the natural resource specialist become involved in; and 3) How can the natural resource specialist help adults develop a land ethic.

Community Problems and Resources

Most persons feel nearly helpless when considering such global problems as air pollution, water pollution, population problems, and other issues of such magnitude. It seems almost a waste of time to tackle such problems head-on since one person can have so little influence on the situation. However, a more restricted problem in one's own community does appear to the average person to be solvable and more likely worth the effort in attempting the solution.

Most persons in a community are aware of neither the local environmental concerns which need attention nor of the community resources which can be brought to bear upon those concerns. One important role for the natural resource specialist is to assist in making local citizens knowledgeable about community environmental concerns and resources.

Community Environmental Inventory

One means of assessing the local environment and local resources is the compilation of a community environmental inventory. Bennett and MacGown (2) have prepared a publication titled: "Guidelines for Planning and Implementing a Comprehensive Community Environmental Inventory." A list of the major divisions included in such an inventory will suggest the nature and value of a community environmental inventory -- several of the divisions are listed below.

I. Introduction
   - Introduction to the Inventory
   - Introduction to the Community

II. Natural Environmental Features and Characteristics
   - Land
   - Water
   - Atmosphere and Climate
   - Plant and Animal Associations

III. Human Environmental Use Areas and Characteristics
   - Production Areas
   - Human Settlement Areas
   - Open Space Areas
   - Transportation-Circulation Areas
   - Recreational Areas

Dr. Delmar Janke, Associate Professor of Science Education, Dept. of Educational Curriculum and Instruction, Texas A&M Univ., College Station.

Community Service and Utility Areas

IV. Environmental Evaluation and Interpretation
- Land
- Water
- Atmosphere and Climate
- Plant and Animal Associations
- Evaluation of the Man-made Environment

V. Related Social, Political, and Economic Aspects
- Population Characteristics
- History of Resource Use
- Current Land Ownership
- Economic Land Values
- Local Governmental Structure
- Major Ordinances and Plans
- Private Organizations and Resource People
- External Resources and Influences

VI. Sources of Inventory Information

As the above list indicates, the job is a big one, but so are the rewards. The compilation of the community environmental inventory is not a job solely for the natural resource specialists, but they do have an important part of the work to do. The inventory is best done by a group of persons from the community. Bennett and MacGown (3) have written another publication which describes how a community might structure a committee to initiate a community environmental inventory. Bennett (1) has also prepared a sample community environmental inventory which illustrates several of the major components of an inventory.

Thus, one of the roles of a natural resource specialist in adult education might be to assist other citizens in preparing a community environmental inventory which would give direction to an adult environmental education program. The preparation of the inventory would not only increase a person's knowledge of the community but would very likely also increase his interest and pride in the community.

Adult Education Programs

Upon first thought, one is prone to consider only formal programs when thinking about adult education. However, we are well advised to consider more options than just a classroom type situation.

Classroom Type Situations

There are many opportunities for the natural resource specialist in classroom situations in adult education. Many community education programs are in existence and new ones are being created in ever increasing numbers. Very often the programs are conducted by volunteer instructors and include classes which might be appropriately taught by a natural resource specialist.

In one community a survey was recently completed in order to determine what interests existed for adult education classes -- this is probably a better method of determining offerings than establishing a set of classes and hoping that people in the community will enroll. Nationwide, many adults are interested in enrolling in classes which relate to recreational and leisure activities. Because of their backgrounds, natural resource specialists often function well as instructors in such classes. Information on natural resources and environmental quality can be readily interwoven into many recreational and leisure-time topics.

Mass Media

Since many more adults can be reached by mass media than could ever be reached in classroom situations we should consider what role can be taken by the natural resource specialist in this type of adult education. Occasionally a special program on radio or television can be devoted to environmental education; however, as a general practice that mode of presentation is too expensive. More fruitful avenues to explore might be the 30 to 60 second spot announcements. Another possibility for adult environmental education is the short interview type programs which involve especially natural resource specialists from the field of agriculture.

Probably a more important question than by what means can we conduct adult education is the question of what can we do, given the appropriate means, that will really make a difference in the manner in which adults live in relation to their environment. That question will be addressed in the section of this paper titled "Developing a Land Ethic - Value Clarification," but first let us consider another alternative in modes of adult education.

Other Modes of Adult Education

The reader will be left to conjure up many different alternative modes of adult education; however, one more will be mentioned here to spark creativity. While driving down the highway one often comes upon signs which state, "Welcome to ABC Soil Conservation District." Would it be possible to have another sign which might read as follows: "Farmers: The Farms in This District Supply the Food Requirements of X Citizens Every Year -- What Can You Do to Be Sure That They Will Do Equally Well 100 Years From Now?"

Another role of the natural resource specialist in adult environmental education then is not only to become involved in classroom type adult education programs but also to consider other different and possibly more efficient modes of adult education.

Developing a Land Ethic

Perhaps the most important role of the

natural resource specialist in adult education is to assist adults in developing a life style which is compatible with the maintenance of a quality environment. Leopold would consider this as developing a land ethic. A process called "value clarification" by Raths, et al, (6) is one technique which can be used to assist persons in defining their own environmental values (i.e., land ethic).

Land Ethic

A land ethic according to Leopold is "a limitation on freedom of action in the struggle for existence." It defines what is permissible and not permissible in terms of our relationship with the land including the animals and plants which grow upon it. Leopold further states, "In short, a land ethic changes the role of Homo sapiens from conqueror of the land-community to plain member and citizen of it. It implies respect for his fellow members, and also respect for the community as such."

Our relationship with the land must not be determined wholly by economic self-interest. We must develop ethical obligations which include a consideration of economics but which also include a consideration for the well-being of the total environment.

Value Clarification

If developing a "land ethic" is an important goal, as I believe it is, how can we help adults achieve such a goal? Raths, et al, (6) have described a process which is called "value clarification" and which can be used to assist in developing a land ethic. After describing the process of valuing (i.e., developing values), techniques of value clarification will be considered.

The following is a partial quote from Raths, et al, (6, pp.28-29): "A look at the process of valuing may make clear how we define a value. Unless something satisfies all seven of the criteria noted below, we do not call it a value. In other words, for a value to result, all of the following seven requirements must apply. Collectively, they describe the process of valuing.

1. Choosing freely.
   If something is in fact to guide one's life whether or not authority is watching, it must be a result of free choice. Values must be freely selected if they are to be really valued by the individual.
2. Choosing from among alternatives.
   Only when a choice is possible, when there is more than one alternative from which to choose, do we say a value can result.
3. Choosing after thoughtful consideration of the consequences of each alternative.
   A value can emerge only with thoughtful consideration of the range of the alternatives and consequences in a choice.
4. Prizing and cherishing
   In our definition, values flow from choices that we are glad to make. We prize and cherish the guides to life that we call values.
5. Affirming.
   We are willing to publicly affirm our values.
6. Acting upon choices.
   Where we have a value, it shows up in aspects of our living. In short, for a value to be present, life itself must be affected.
7. Repeating.
   Where something reaches the stage of a value, it is very likely to reappear on a number of occasions in the life of the person who holds it. Values tend to have a persistency, tend to make a pattern in a life."

There are many techniques of value clarification. Several are described in Raths, et al, (6) book and several more are described in a book by Simon, et al, (7). I strongly suggest consulting them for alternative techniques in value clarification.

For our purposes here let us consider value clarifying responses which might be used in our educational programs and which could be helpful in assisting our students to clarify their values. Thirty clarifying responses listed in Raths, et al, (6, pp. 55-62), are listed below.

1. Is this something that you prize?
2. Are you glad about that?
3. How did you feel when that happened?
4. Did you consider any alternatives?
5. Have you felt this way for a long time?
6. Was that something that you yourself selected or chose?
7. Did you have to choose that; was it a free choice?
8. Do you do anything about that idea?
9. Can you give me some examples of that idea?
10. What do you mean by _____: can you define that word?
11. Where would that idea lead; what would be its consequences?
12. Would you really do that or are you just talking?
13. Are you saying that . . . . (repeat)?
14. Did you say that . . . .(repeat in some distorted way)?
15. Have you thought much about that idea (or behavior)?
16. What are some good things about that notion?
17. What do we have to assume for things to work out that way?
18. Is what you express consistent with . . . (note something else the person said or did that may point to an inconsistency)?
19. What other possibilities are there?

20. Is that a personal preference or do think most people should believe that?
21. How can I help you do something about your idea? What seems to be the difficulty?
22. Is there a purpose back of this activity?
23. Is that very important to you?
24. Do you do this often?
25. Would you like to tell others about your idea?
26. Do you have any reasons for (saying or doing) that?
27. Would you do the same thing over again?
28. How do you know it's right?
29. Do you value that?
30. Do you think people will always believe that? or, "Would Chinese peasants and African hunters also believe that?" Or, "Did people long ago believe that?"

The asking of the above questions in a non-threatening and open manner will cause us to ponder and seek more information and will tend to make us consider what actions we take and why we take them. This is what developing a land ethic is about and it really sums up what are important roles of the natural resource specialist in adult education -- supplying information about concerns of the environment and assisting adults in clarifying their values that relate to the ecological environment (i.e., developing a land ethic).

Is the development of a land ethic important to you? What can you do to help others develop a land ethic?

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Enlisting Educational Institutions in Adult Environmental Education

Clyde W. Hibbs

Your presence this afternoon is testimony of your interest in the potential role of adults in improving the quality of our environment. This is currently a matter of high priority for the Soil Conservation Society of America. The recent SCSA publication "Environmental Quality and the Citizen: A Teaching Guide for Adult Education Courses Related to the Environment"(1) is an important contribution in the area of adult environmental education. This conference itself is exemplary of the various adult education experiences provided for both members and nonmembers of SCSA.

By way of introduction I would like to suggest that education is a process of changing human behavior to achieve desired goals. Our primary concern here today is environmental improvement through adult education or, if you prefer, through continuing education. I have been asked to discuss the topic Enlisting Educational Institutions in Adult Environmental Education Efforts. The challenge we have for this meeting was succinctly stated in the May 1972 Annual Report to the President and to the Council on Environmental Quality by the Citizens Advisory Committee on Environmental Quality, as follows: (2)

> "Improvements must be made in the quality and accessibility of environmental education in this country. It must reach citizens of all ages, encompass numerous academic and technical disciplines, and utilize the broadest possible range of formal and informal educational settings."

In 1970 a conference was held in Washington, D. C.,sponsored by the American Institute of Biological Sciences, on the theme "Environmental Education: The Adult Public." In giving a charge to the conference Dr. Edward J. Kormondy, Director, Office of Biological Education, American Institute of Biological Sciences, stated: (3)

> "The adult education effort is to me the most critical. First, because this element, now outside the formal channels of education, will continue to be the decision maker for the next 15 to 20 years, and it is within this area that most critical and disruptive decisions will have to be made. We cannot afford to focus on youth unless the elders die off before changing our course, which, if time permitted, would be the most efficient way of instituting change. Not only are these elders the most difficult to reach but they are the most reluctant to accept the required changes in their life styles."

Within the past five years there has been an increased interest in environmental studies by all types of educational institutions. This has been particularly true in our colleges and universities. This increased interest is in evidence by the large number of educational institutions listed in a recent directory prepared for the Conservation Education Association. Published by the Interstate Printers and Publishers, Inc., the list includes colleges and universities offering curricula in environmental studies and in related areas. (4) Frequently, I receive requests for information about our Natural Resources Program at Ball State from institutions that are expanding existing environmental programs or developing new curricula.

We offer a minor and major in Natural Resources at both the undergraduate and graduate levels and a cognate in this area for doctoral students. In addition, we anticipate that approximately 1200 students will enroll in our natural resources courses this year in fulfilling general studies requirements.

Planning for our program began in 1965 with the establishment of an interdisciplinary Natural Resources Advisory Committee to explore

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Dr. Clyde W. Hibbs, Chairman, Department of Natural Resources, Ball State University, Muncie, Indiana.

the future role of Ball State in the environmental field and to make appropriate recommendations. After two years of intensive study the members of this study group recommended that 1) curricula in Natural Resources be initiated and 2) an administrative unit for Natural Resources be established. Both of these recommendations have been implemented.

Our Natural Resources curricula are designed to accomplish three things: 1) sensitize students to our environmental crisis, 2) provide them with an understanding of our environmental problems, and 3) motivate and prepare students to be able to work effectively toward achieving a quality environment. The major part of our efforts are devoted to offering courses on our university campus. We have also offered courses off campus primarily for in-service teachers and for professional conservationists.

From the very beginning there has been a recognition of the need to provide educational services to people off campus. Our annual report indicates we have been active in this area. However, this is the first year that it has been possible to officially allocate staff time for this activity. If you have specific questions about our Natural Resources Program at Ball State, I will be glad to answer them if you will write to me at the college.

I will now try to suggest ways of enlisting educational institutions in adult environmental education. First, I suggest you arrange to visit with the people at your local college or university with leadership responsibilities in the environmental area. The dean of instruction or the vice president for academic affairs should be able to identify the appropriate people for you to contact. In some cases you may be referred to two or more staff members in various departments who have an interest in this area. In any event your visit should enable you to become better acquainted with the college, learn about the environmental education activities being conducted, and meet those staff members primarily involved. Hopefully, this may lead to the development of a cooperative program of mutual benefit. However, at some colleges you may experience difficulty locating someone with whom you may visit simply because there has been little activity in the environmental area. Upon encountering this type of situation you might express your interest in seeing the school place greater emphasis on environmental studies and express your willingness to assist. A word of encouragement may result in the establishment of a new course, the restructuring of an existing one or possibly the development and implementation of a new environmental curriculum.

More emphasis is needed in offering courses off campus in the local community where enrollees live. Students are usually more interested in studying their local problems and formulating solutions to them than reading about the environmental crisis in some other state or nation. Last year we added a new course entitled "Environmental Issues" which is designed to be offered off campus. The instructor of this course will need to spend some time in the community where it is to be taught, relying on help from local key people in identifying their environmental problems which will serve as the focus for the course. Those who enroll should gain an understanding of the root causes of the problems and participate in the formulation of alternatives in resolving them.

Educational institutions frequently host conferences, workshops, and mini-courses with the leadership being provided by the office of Continuing Education in cooperation with academic department(s) having similar environmental concerns. Frequently arrangements can be made for college faculty to assist in planning and conducting a wide variety of environmental experiences either on the campus or elsewhere. Staff members may be available as consultants for adult education programs on a continuing basis.

There are many other types of facilities and services that educational institutions are often happy to provide. Some have developed outstanding outdoor laboratories or environmental interpretation centers which offer rich learning experiences for all age groups. Resident facilities are sometimes available in a natural setting at a nominal cost where business meetings, conferences, and workshops can be scheduled. By planning well in advance for the use of the facilities, arrangements may be made to provide an environmental focus for the participants.

Many colleges have an arboretum, natural areas, or other outdoor facilities located on or near the main campus that are available to and frequently used by the public. Christy Woods, a sixteen-acre outdoor learning area on the Ball State campus, is an excellent example.

Students are becoming increasingly involved in various types of internship programs as an integral part of their educational experience. Many would welcome the opportunity to work in adult education programs concerned with environmental improvement. This type of association could easily become a reciprocal learning experience which would also strengthen the relationships between colleges and the adult public.

The faculty and students of colleges have much to offer the adult public through their research expertise. Through this approach

better understanding of environmental problems can be gained and innovative solutions can be developed. This type of relationship can provide a "world of reality" in which students can learn. Research data resulting from this type of activity can be used by resource agencies and governmental units at all levels and serve as a basis for decision making.

Educational institutions can provide many other services and facilities relating to adult environmental education. These include radio and television facilities, data processing centers where environmental information can easily be retrieved, research facilities, and libraries, including multimedia materials.

I would like to conclude my remarks with this quotation from the April 1971 Report to the President and to the Council on Environmental Quality by the Citizens Advisory Committee on Environmental Quality: (5)

> "Citizen concern over the quality of our environment is not a transitory phenomenon. It was long in coming, is decidedly here to stay, and will grow stronger with the passage of time."

We must place greater emphasis on environmental education at all age levels and in all subject areas if we are to improve the quality of life on our planet. Realizing that decisions relating to our environment are made primarily by adults, educational institutions must give adult education higher priority.

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Planning Effective Field Studies and Selecting Appropriate References

Duane A. Bosworth

I think it's safe to say we all suffer from a similar problem - even those of you here who might choose to consider yourselves educators, as opposed to those of us who consider ourselves resource specialists, technicians or researchers - we all conceive of "field studies" as something that is done in natural surroundings.

The "field" we think of may be a woods, a park, a wildlife sanctuary, a river, a pond, or any one of many natural kinds of places. This is one conception we need to shake before we can make any real progress toward planning effective field studies.

But even before planning a field trip, determine if this is the best way to accomplish your learning objective. In the book ADULT EDUCATION, Bergevin, Morris, and Smith give us four reasons for doing a field study:

1. To provide first-hand observation and study of something that cannot readily be brought to the learning group. An example of this would be to observe how erosion occurs.
2. To stimulate interest and concern about conditions or problems that need study. (Many adults are not aware of the scope of problems --- in our home territory we become accustomed to our environment.)
3. To illustrate the results of a practice or a course of action in its natural environment. (Contour strip cropping or top quality pasture or range is much easier seen than described.)
4. To relate theoretical study to practical application. (For example - good housing development planning in practice.)

Duane A. Bosworth, Public Information Specialist, West Regional Technical Service Center, Soil Conservation Service, Portland, Ore.

Every field trip should have a purpose and a plan. Usually in adult environmental conservation education the purpose is to give the class members a chance to observe and study environmental problems, conservation practices, or resource management programs that relate specifically to the environmental education courses in which they are enrolled.

Field trips may also be organized to give an adult group a look at resource management or environmental problems or projects within their community so they can learn more about citizen influence on community resource management.

For example --- ecological studies field trips should include both natural and man-made environments to show the class members:

a. the contrasts and differences
b. how natural and undisturbed ecosystems become modified through man's use and influence.

Look again at your purpose for a field study before you make arrangements and see if you are really "playing fair" with students. If your purpose is to "put over" an idea or a point of view, your purpose is too narrow. If your purpose is to keep people needlessly passive and dependent, you are too narrow also.

Sheets, Jayne and Spence in their book, ADULT EDUCATION PROCEDURES, say: "On a field trip we often see people doing other things...we watch and note the meaning of their action... we are on the sidelines, without authority or ability to alter the event. If, however...observation is combined with participation, the field trip becomes more meaningful."

If you consider "lecture" as one means of learning, and "direct meaningful experience" another, students by and large retain the least from lecture and they retain most from direct meaningful experience. Good field studies would blend these two teaching methods.

Worth noting is a peculiarity

in the behavior difference between children and adults and the way each might react to field studies. Children possess a natural curiosity. They like to explore and do things. They like to "mess around" instead of being told.

We, as adults have been molded by the educational system and by life itself, into passive listeners who, by and large, would rather be told than to involve ourselves too deeply in direct meaningful experience.

Yet in practice, many field studies are run just the opposite. Children are too often lined up and told facts when they are really itching to explore and discover. Adults are too often turned loose to gather information, but many adults would really rather be told.

For this reason it's quite probable that a number of adults out on a field study would prefer the more passive lecture.

However, a good resource person will come to regard adult education activities as opportunities for all persons involved in the learning venture constantly to improve their performance together, to become what can be called a learning team. In other words the field study guide -- if he's good -- will lean on a few "discoverers" in the class to help educate those who are not as curious.

Preparation for the field study must include classroom time so all understand what they are going to see, why the field study is important, and how it relates to the class and course work.

Here are some essentials in planning:

1. Selection of the site or route -- in adult education programs the field trip is a one-shot opportunity, and therefore must be as meaningful as possible. The instructor must have a clear idea of the objectives of his study course. The location and route must be carefully chosen to include the specific studies and investigations that are relevant to the class work or to the purposes of the field trip. The instructors and the leaders must seek out the location, and it often means several exploratory trips and one or more dry runs. Adults in general are not impressed when things get fouled up.
2. Physical arrangements -- the instructor or leader must make arrangements for the trip well in advance. Write or call the land owner, land manager, or agency whose property is to be visited. Give a clear explanation of the date proposed, the time, and the purpose of the trip; also the number of people likely to be involved. Get permission in writing if possible. Rest stops and lunch stops must be chosen.
3. Class or group arrangements -- give each person a written outline of where they are going and what they will be able to observe. Annotated sketch maps are helpful. If the group is traveling by bus, there should be a microphone and amplifier. If traveling by car, minimize the number of vehicles by encouraging car pools. Be sure the class understands the purpose of the trip, what they are expected to do, and that each member is aware of rest stops, lunch stops, and rendezvous points.
4. During the trip -- keep an eye on the class members to see that they do not inadvertently damage fields or property, get stuck in the mud, leave gates open, or take a wrong turn. Even though rules are laid out before the field trips, people sometimes forget, or deliberately violate outdoor good manners by picking up souvenirs. Watch for litter after lunch stops. Remind them to come prepared for weather -- rain, snow, or heat. Encourage discussion at every stop; if an agency representative is acting as guide, the leader should encourage him to talk, and should ask questions if the students are slow or shy. Be flexible if something unplanned comes up for discussion.
5. Follow up -- at the end of the trip, or at the next class meeting, spend some time reviewing what they have seen and getting them to summarize what they have learned, or to ask further questions. By all means write a letter of thanks to your hosts.

What about references? Let's divide references into two different groups - those that apply to field studies, and those that are general background for the entire course.

Specific references that apply to field studies should be provided to students in advance. These references should give them background information on what they will see and study during the field trip. For example:

A trip to a National Forest, National Park, or other public land means that the students should have read something on the management practices, history of the agency, and governmental structure. History of the area to be visited is often useful.

A trip to a farm means providing references or information on crops, or kind of farming; maybe a history of land use and

and land use changes in the vicinity of the farm.

The reading list should be as broad as possible and include books or magazine references the students may want to re-read following the trip.

For general kinds of references it's well to know that what many environmental education thinkers are thinking of when they talk environmental education is not the kind of subject matter that can be contained in one book.

Many kinds of references are needed to get a complete picture. Some very good and inexpensive references have been done. What's Ecology, a small paperback, is one that is almost totally biological. You Are An Environment is almost totally social. Energy and Man's Environment does a great job of pulling together the many aspects of energy as it relates to many disciplines, but of course it is all about one aspect of environment - energy.

One thing should be kept in mind, "the environment" is today's fastest growing publishing field. Current lists are soon outdated. Many organziations are doing reviews of new environmentally oriented books and it is well to keep up to date. The SCSA Journal is a good check point for new publications.

Don't forget to use the bibliographical references in "Environmental Quality and the Citizen." It is divided by subject matter grouping and contains most of the background books you might want.

The following list of books, by no means definitive, contains several of the so-called "classics" in the field of environmental conservation, and they are written from many points of view. But they are all good reading for anyone seeking a good over-view of the field.

SUGGESTED READINGS

America's Land and Its Uses, Marion Clawson
A Sand County Almanac, Aldo Leopold
Defending the Environment: A Handbook for Citizen Action, Joseph L. Sax
Design With Nature, Ian McHarg
Ecology, Eugene Odum (Modern Biology Series)
Environment, A Challenge to Modern Society, Lynton Caldwell
Environmental Conservation, Raymond F. Dasmann
Living Earth, Peter Farb
Man in the Web of Life, John H. Storer
Plants, Man, and the Ecosystem, W.D. Billings
Silent Spring, Rachel Carson
The Conquest of Nature, R.J. Forbes
The Forest and the Sea, Marston Bates
The Immense Journey, Loren Eiseley
The Last Landscape, William H. Whyte
The Politics of Conservation, Frank Smith
The Subversive Science, Paul Shepard
Wilderness and the American Mind, Roderick Nash
The Living Landscape, Paul B. Sears

Environmental Quality and the Citizen — A Curriculum Guide

Kenneth R. Tow

This paper deals with the curriculum guide, "Environmental Quality and the Citizen." More specifically, it deals with ways of utilizing the guide in implementing local adult environmental education programs. It is of special interest to members affiliated with the Society's 135 chapters throughout the United States and Canada, and also to those persons affiliated with the activities and programs of the Society's Environmental Conservation Education Division.

The guide itself is self-explanatory once an adult environmental education activity is organized and underway. The obstacles to such a course are most often associated with implementation and planning. Therefore, discussion here will deal not so much with the curriculum guide per se, but rather the philosophies which have been associated with its development and subsequent use. This is not to imply that there are restrictions on the use of the curriculum guide; I will only attempt to portray the thought behind its development and the potential usage of the material as foreseen by the authors and others associated with its development, including myself.

The Soil Conservation Society of America has a long-standing record of interest and involvement in the process of conservation education, which in more recent years has come to be known as "environmental education." It was this basic interest and involvement in environmental education programs which led to the application for a grant from the Office of Environmental Education, and subsequently the development of the guide.

What we are dealing with can best be described as a process -- a process of motivating natural resource conservation professionals (members) and chapters of the organization to implement local adult environmental education programs. The existing structure within the organization would appear to be more than adequate to foster the program among chapters. The Environmental Conservation Education Division has been delegated the responsibility to work with chapters, through similar divisions and committees that exist within chapters. Thus, the matter of motivating chapters is one obstacle, although not a major one, which will require attention.

For our purposes here today we will assume that our "chapter" is interested in initiating such a program. One of the first tasks facing the chapter conservation education committee is the inventory of available resources within the chapter and the local community. The conservation education committee also must determine what the chapter's commitment to the program will be, both in terms of input of manpower and financial resources. Before preparing any proposal, members of the committee will also take into consideration the needs of the community, and the available facilities and people in relation to environmental education. Are areas readily available for field study, what are local environmental issues, and what are the life styles and principal sources of income of the members of the community? These are a few of the many questions that must be asked and answered. Obviously there is a marked difference in the environmental education needs of citizens in Chamberlin, South Dakota; Athens, Georgia; and Steubenville, Ohio.

Before implementation of the program can begin, the chapter or its committee must determine if the citizenry, school officials, etc., recognize the need for environmental education. If they do and are receptive to such programs, then implementation of the program may begin immediately.

If they are not particularly enthusiastic about the whole idea, or if they believe that environmental education is not needed or is not applicable to their particular community, the chapter will be required to "sell" the idea of environmental education.

Kenneth R. Tow, Program Assistant, Soil Conservation Society of America, Ankeny, Iowa.

There are numerous ways of overcoming this community obstacle. Evidence of local interest in the program will increase its appeal to administrators of adult education programs. In some cases the use of Environmental Education Advisory Councils in the local community has proven to be worthwhile in initiating and securing approval for such programs. These citizen groups may even be established in conjunction with the development of the adult environmental education program. In forming such a Council, the interests of not only the chapter, but the community at large, education groups, and other local conservation and environmental organizations must be taken into consideration.

Once the course has been implemented, this Advisory Council can continue to serve the environmental education needs of the community. As Clausen points out in the preface of the curriculum guide, an advisory group can also be a valuable resource to the instructor or course moderator in identifying local problems, obtaining local and statewide information, and in promoting enrollment in the course itself.

Another task facing either the advisory group or those in charge of administering the program is that of selecting an instructor or moderator for the duration of the initial series of seminars. As Clausen points out in the preface of "Environmental Quality and the Citizen," one instructor should not be required to handle all teaching responsibilities. Furthermore, instructors or session moderators need not necessarily be professional educators. However, he or she should be capable of leading group discussions, and will be required in most cases to help coordinate the overall program. Chapters and planning groups should realize that the selection of a qualified and "willing" instructor may be important in securing approval for the course offering. Even if funds are available and local interest can be demonstrated, administrators are unlikely to offer the course if they foresee any difficulty in securing instructors. Again, coordination by the chapter's conservation education committee ahead of time can alleviate these potential problems. The chapter could provide one of its members as course moderator on a volunteer basis.

Once the moderator or instructors have been selected, we are ready to begin the actual process of implementing the program. Depending on its degree of involvement in the program, the chapter may assist in promoting enrollment, or it may carry the entire responsibility for enrolling participants. It will be necessary in most instances to promote the program extensively within the community in order to stimulate attendance. Even if a strong local interest has been demonstrated, it will still be necessary to carry on a good public relations and promotion program if notice of the offering is to reach most of the people in the community.

Promoting the course will be much the same as selling a product. There is a certain "give and take" to such an educational process. The education program must be appealing enough to make it seem worthwhile in the eyes of the prospective participant. Put yourself in his situation and ask, "Why should I sign up for this program or attend any of the sessions?" Then try to answer that question through the promotional material. In other words, the participant has something to give, primarily his time. In return he needs to be assured that he will get something of value to him. Convincing most people of this fact is not a difficult task with regard to matters relating to the environment. This is the age of "environmental awareness" and the time is ripe for such programs. But the course administrators and chapters must realize the importance of convincing the prospective participant of his need.

In promoting such a program we are appealing to the individual's sensitivities. Educators will say that we are seeking to enroll an individual in an educational experience, and thus change his behavioral patterns. In this particular situation, I prefer to think the goal of the educational process to be the establishment of some sort of a conservation ethic, and a concern for the world we live in.

What is our reason for going to all this trouble? As an organization, we maintain as one of our goals and objective, "better conservation education of the people." Thus, if we can convince an individual of the need for conservation and a better environment, he will consequently be a more informed citizen, and public support for needed conservation and environmental protection programs will have been increased.

Actual use of the curriculum guide itself and conduct of the individual sessions is left entirely to the discretion of the instructor. As the name implies, the publication is a "guide" and should be treated as such. Throughout the preparation of the materials, the authors repeatedly emphasized that it was intended to be a "discussion guide" and not a format for a formal lecture series. Ideally, the course participants would learn as much from each other as they do from the instructor and the local resource professionals who participate in presenting the material.

The variation in style and content of programs as they are developed in different parts of the country will depend upon the size of the community and on local variables.

In summarizing my experiences in developing the curriculum guide and the associated program, I believe that in environmental education, just as in life and politics, there is no middle ground, but instead a wide spectrum from the far left to the far right. It is important to realize that ideas and proposed programs will fall at some point along that spectrum, and in the event too great a difference results, compromise will be necessary. In the same respect, it is virtually impossible to write or develop a curriculum guide which can be ideally applied to all adult environmental education situations. Likewise, neither is it feasible to undertake the preparation of a separate guide for each and every potential educational opportunity.

A curriculum guide would therefore seem to be most useful if it is simple, direct, to the point, and as unrestrictive as possible. It should also at the same time be stimulating, flexible, innovative, technically correct, and offer current and timely information and methods of instruction. We believe that "Environmental Quality and the Citizen" is all of these things.

Yet, at the same time, it must be said that "Environmental Quality and the Citizen" is a compromise of several viewpoints and philosophies. Furthermore, local interpretations of the materials contained in its pages will be influenced by the environmental philosophies of the people involved at that stage of planning and implementation. They are the ones who in the end will give the program its true direction and temperament.

I believe that the chapter's most significant contribution to the program, in addition to furnishing expertise and manpower, will be to offer encouragement, stimulate ideas, and reinforce the efforts of non-SCSA members who become involved in the program. This assistance will be needed to overcome the many obstacles which lie in the path of the environmental education experience, obstacles which are by no means insurmountable.

Chapters should view these obstacles not with apprehension, but as the true challenge of environmental education insofar as the Soil Conservation Society of America is concerned. The successful environmental education program, no matter what its content or subject matter, will be of benefit to the participants themselves, and all of mankind. We believe the mere fact that an environmental education course was made available to the public is sufficient justification for the time, effort, and expense involved.

Therefore, we must realize that the opportunity exists. It is ours for the taking. The ultimate success and quality of the programs offered will depend on the commitment the chapter is willing to make, and the support and participation furnished by local communities.